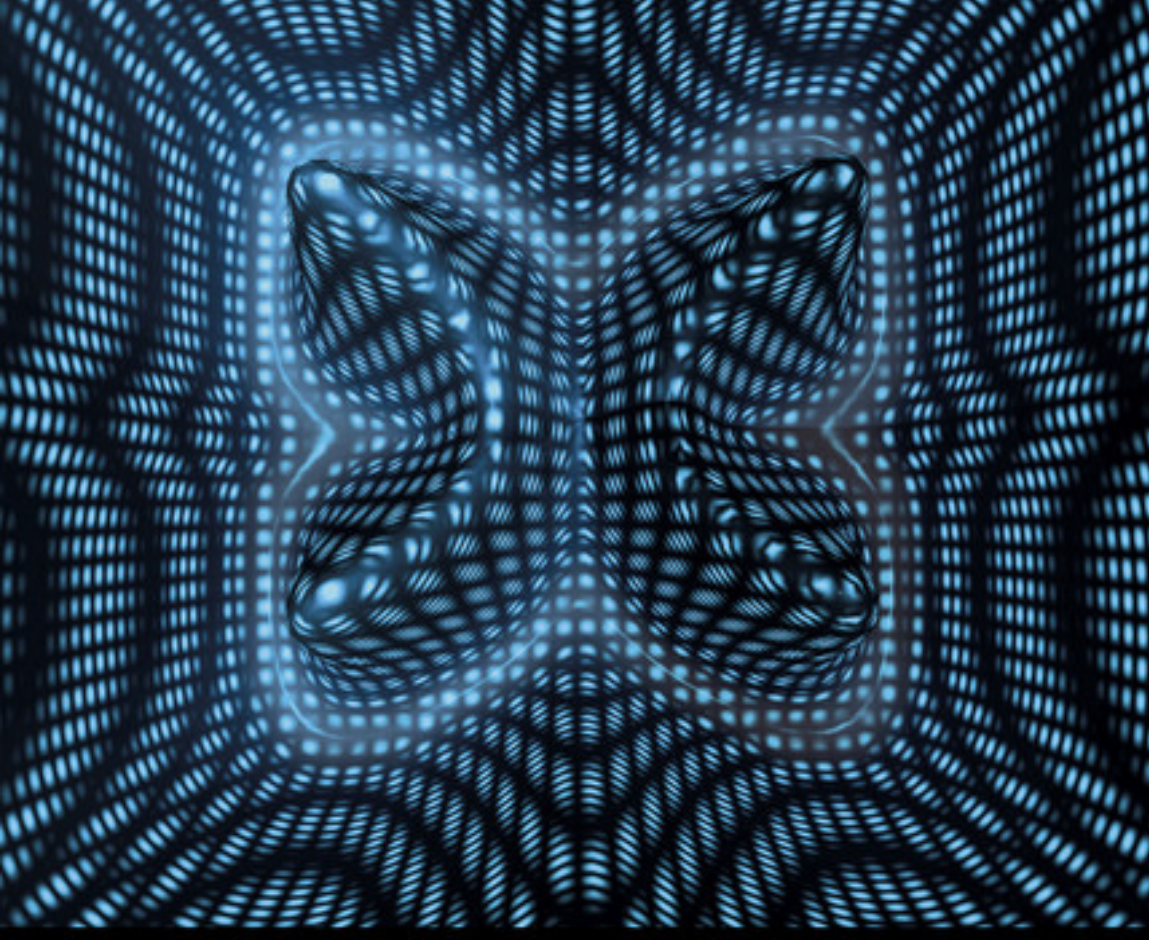

Systemic Functional Linguistics
Exploring Choice

Lise Fontaine,
Tom Bartlett and Gerard O'Grady

CAMBRIDGE

Systemic Functional Linguistics

Exploring Choice

This stimulating volume provides fresh perspectives on choice, a key notion in Systemic Functional Linguistics. Bringing together a global team of well-established and up-and-coming systemic functional linguists, it shows how the different senses of choice as process and as product are interdependent, and how they operate at all levels of language. Taking an interdisciplinary approach, it covers a range of linguistic viewpoints, informed by evolutionary theory, psychology, sociology and neuroscience, to produce a complex but unifying account of the issues.

This book offers a critical examination of choice and is ideal for students and researchers working in all areas of functional linguistics as well as cognitive linguistics, second language acquisition, neurolinguistics and sociolinguistics.

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Systemic Functional Linguistics

Exploring Choice

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Gerard O'Grady

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Introduction: choice in contemporary systemic functional theory

Lise Fontaine

The notion of choice is a core theoretical concept which has played a key role in the development of systemic functional theory since its early stages. It is so deeply integrated that it has been taken as axiomatic. The basic tenet of Systemic Functional Linguistics (SFL) is that language is a system of choices, yet the very nature of choice is rarely considered. As a result, the word 'choice' is pervasive in SFL literature and is used both commonly and technically, often without distinction. This has created problems for the theory. In fact, despite being what makes SFL an attractive theory, 'choice' as a term is also at the source of criticism (see Fontaine, this volume) precisely for the reason that it has not been explicitly debated within SFL literature. Even in the few volumes which highlight the term in their title (e.g. the three-volume festschrift, *Meaning and Choice in Language: Studies for Michael Halliday* (Fries & Gregory, 1995), and the edited volume *Linguistic Choice across Genres: Variation in Spoken and Written English* (Sánchez-Macarro & Carter, 1998)), the notion of choice seems to be taken tacitly as a working assumption behind grammatical description or as an application of the theory rather than as a primary concept to be analysed and debated in its own right. To date, there has not been a publication which explicitly and critically examines the place of choice in Systemic Functional Linguistics. It is precisely the aim of this volume to open the debate on choice and offer a critical examination of its place in systemic functional theory.

Developing dialogue in the SFL community about this issue required a catalyst, and so when, in 2009, we hosted the 21st European Systemic Functional Linguistics Conference and Workshop (ESFLCW) at Cardiff, we made 'choice' the theme. Following on the successful discussions of the conference, we opened a call for contributions for this volume, challenging contributors to deal explicitly with the concept of choice by theorising it and by offering a comprehensive and coherent treatment of its place and use in SFL. The twenty-two chapters offer a thorough and varied examination of choice, which challenges and drives forward our understanding of choice in several key ways, as explained later in this Introduction.

The centrality of choice within SFL has its roots in Halliday's early development of his theory. 'Choice' is inherent in conceptualising language structure in terms of paradigm. In consequence, choice is closely bound, for Halliday as for Saussure, Malinowski and Firth before him (see Halliday, this volume), into the modelling of meaning as a function of context. As early as 1961, with 'Categories of the Theory of Grammar', Halliday introduced system as a category in order to account for the relation among a group of items (1976c:67). System for Halliday, and following on from Firth, is a representation of paradigmatic relations which "would be a representation of the item in terms of a set of features, each feature being in contrast with a stated set of one or more other features" (Halliday, 1976d:92). This view of system naturally gave rise to the notion of choice since Halliday's insight was to present items in terms of a set of features, which, in contrasting, create paradigmatic choices (1976d:93). Halliday explains this himself in this volume.

By 1969, Halliday was very clear on the importance of choice in his theory: "the underlying notion in the grammar is that of choice" (1976e:6). This position is highlighted well by Halliday in the following:

> The speaker of a language, like a person engaging in any kind of culturally determined behaviour, can be regarded as carrying out, simultaneously and successively, a number of distinct choices. At any given moment, in the environment of the selections made up to that time, a certain range of further choices is available. It is the system that formalizes the notion of choice in language. (Halliday, 1976e:3)

The current status of choice remains central but its meaning and use has spread to an extent that it requires a critical evaluation. Recently a selection of key terms in systemic functional theory were defined in Matthiessen, Teruya and Lam (2010). Choice is included very briefly but it is nevertheless clear from the two definitions they provide that Halliday's original sense of choice as a term in a system is still valid. However, a second sense is also given which defines choice as an act: "selection (of an option in a system), choice is part of the overall account of the process of traversing a system network making selections along the way" (2010:69). As a kind of disclaimer to the definition, Matthiessen *et al*. make a point of adding that the sense of choice as selection does not imply consciousness or intention (2010:69).

This volume has been motivated by a pressing need for theoretical consistency and comprehensiveness in relation to the place of choice in systemic functional theory. We are bringing together a variety of linguistic perspectives, informed by evolutionary theory, psychology, neuroscience, sociology and computational approaches to produce a complex account of choice; one which will create a common ground for further development. We set out to answer five key questions concerning choice; each of these topics is presented below in relation to how it has been addressed.

What is the concept of choice?

Although the entire volume seeks to answer how we think choice works in a paradigmatic and probabilistic view of language, an important first point of address involves establishing a contemporary theoretical position of choice in systemic functional theory.

Our first step in addressing the nature of choice naturally comes foremost from Halliday himself, yet it is equally important to consider its appropriation and development by others who are contributing to the theory. Halliday's views on choice have developed over these past fifty years but, as he demonstrates here, his original ideas about the importance and centrality of choice are as valid today as they were then. His chapter outlines his key contribution to the debate, namely, that choice, as the core mechanism for expressing meaning, creates a contrast between what is chosen and what is not but could have been. Choice is how meaning is created. Given his view of language as social semiotic, the nature of choice must be interpreted semiotically. Halliday argues that choice has no inherent bias towards the individual meaner (i.e. speaker): choice as semiotic act can be seen as an activity of a whole population. This view gives rise to our understanding of the non-random "quantitative patterns that characterise language as a probabilistic system". Halliday's main point is that speakers are taking part in a social semiotic act, where choice is best viewed in evolutionary terms as analogous to natural selection: "the totality of semiotic activities on the one hand maintains and supports the existing eco-social order while at the same time, on the other hand, nudging it in the directions in which that eco-social order is going to change".

Halliday's discussion is extended in important ways by Butt, Moore and Tuckwell, who use an evolutionary perspective to shed light on our understanding of choice. Drawing on the work of Sapir, Darwin and various biological views of selection, they explain the nature of choice and selection in various systems. More specifically, they consider the opposition introduced by Darwin between natural selection and human selection. As a means of trying to bridge this seeming contradiction, they propose the concept of motivated selection, which is defined as: "those regularities that could not be rationally explained away as random, and whose effects in a semantic ensemble appear to constitute a convergence of diverse resources towards some recognisable end". In order to examine the issues surrounding motivated selection, an analysis of clausal taxis is discussed, and they show how there is an ensemble effect which is both "an extension of the grammar and a rhetorical unit". In their view, choice provides an important role in bridging a gap in our understanding of experience.

Freddi's chapter frames the concept of choice theoretically in terms of paradigmatic and probabilistic views of language. By looking at conditional probabilities, markedness and register variation, she argues that choice is the

key to understanding the relation between system, instance and practices (register and corpus). One of her main concerns is the oscillation found in the literature between paradigmatic and syntagmatic orientations to language. She explains how this oscillation arises when trying to reconcile the relation between frequencies of occurrence and the probabilities assigned in the system. By exploring the relation of probability to choice, she demonstrates how, within a probabilistic grammar, choice is a fundamental concept in understanding this relation because it is "the way of capturing the relation holding between relative frequency in text and its theoretical significance". She concludes that choice can and should be extended beyond paradigmatic relations to the syntagmatic axis of language.

Going deeper, in a sense, than the concept of choice, Bache questions what a term in the system can or should be, and where it comes from. In answering this question, the very interpretation of choice is taken to task. As Bache notes, the impression given in the literature about choice "implies *more* than the mere availability of features in an inventory but *less* than a deliberate, purposeful communicative act". Bache uses the example of the progressive/nonprogressive distinction in the English tense system to offer a proposal for how features can be identified in the first instance and how their systemic relation can be described. Drawing on Hjelmslev's concept of 'commutation', Bache argues that, while choice in Halliday's sense of paradigmatic relation, or system, is valuable, any feature in a system (i.e. a choice as option) should be communicatively motivated, in other words the terms of a system should satisfy higher-level communicative strategies.

In a similar way to Freddi, Fontaine bases her interpretation of choice on probabilities but, in contrast to Freddi, she offers an account of choice as process. She proposes a view of choice as selection that relies on an interpretation of the significance of probabilities in relation to system networks from a language processing perspective. In doing so, she attempts to reconcile perspectives from psycholinguistics, corpus linguistics and computational approaches to language. Her discussion draws on the distribution frequency of referring expressions in three small corpora. Her position may be seen as controversial in terms of her interpretation of system networks, because in trying to account for the place of choice in a complex system, she exploits the counter-intuitive nature of probabilities to show how choice, in terms of process, could be seen as a complex recursive function.

Fawcett, like Bache, directly addresses the question of what the concept of choice is. This chapter offers a discussion of the main views on how we choose, what choosing is, and how speakers choose. While acknowledging that the everyday meaning of 'choosing' entails 'deciding', Fawcett explains why the system networks are not a mechanism for deciding. What he proposes is that choosing does not happen in the place where the options are modelled (i.e. the

system network). As Fawcett points out, claiming that a grammar can 'choose' would be a misleading personification of a grammar. How speakers choose the features in the system networks, Fawcett claims, is handled in higher-level planning components, which in computational linguistics are referred to as 'microplanners'. In Fawcett's model, a microplanner is needed for each major area of meaning, e.g. the various types of Theme. The two main senses of choice, then, are represented in two different areas of Fawcett's full integrative model of language.

How does choice contribute to linking language and cognition?

Halliday's systemic functional theory has been developed in terms of an inter-organism orientation (Halliday, Lamb & Regan, 1988:2; see also Halliday, 1978b), where 'organism' in this context refers to an individual. However, there has always been, at least implicitly, a point of contact with an intra-organism orientation, and this has been identified in the literature most notably, as discussed above, in statements which try to insist that the concept of choice does not include active or conscious intention, as in an act of deciding. However, Halliday acknowledges the value of others' focus on the intra-organism orientation:

> Linguists tend to be either more interested in what goes on inside the organism, in its head, or more interested in what goes on between one organism and another. I'm almost entirely, myself, concerned with the inter-organism approach to language; equally, I recognize the importance of the other kind, but I don't do it. Therefore, I reciprocate this impression of complementarity, and would add to it that I find in Syd Lamb's work a complementary view which is totally compatible with my own. (Halliday, Lamb & Regan, 1988:2)

In response to this, one of the questions this volume seeks to answer is: How does choice contribute to linking language and cognition? It follows that, in the context of choice, it will be useful to establish whether SFL must remain within, as Halliday puts it, an inter-organism orientation, or whether it could be developed towards bridging across to meet a more intra-organism orientation.

Perhaps the most obvious person to explore any potential common ground is Lamb himself in his contribution here, in which he endeavours to bridge the two orientations. He shows how his neurocognitive linguistic theory can be related to Halliday's systemic functional theory by focusing on the nature of choice as portrayed in systemic networks but viewed from the perspective of relational networks. Lamb offers an enhanced understanding of systemic functional choice, using narrow relational network notation to show how the principle of choice, or contrast in meaning, operates. Through this work, Lamb

proposes a neurologically plausible justification for Halliday's original insight which led to his systemic functional theory.

Asp offers a very welcome discussion of choice in SFL from a neurolinguistic perspective, arguing that if we consider choice as meaning potential, we are left with "paradoxes of unconscious choice and unintentional agents". She explores in what sense speakers can be seen as agents of our discourse. Using evidence from neurolinguistic imaging, she develops a view of speaker as agent, who is "not only capable of, but continuously making, conscious choices in discourse". This chapter gives a thought-provoking account of the neurolinguistic evidence for agency. After deliberation, Asp concludes that system network notation, in its current form, is not suited to accounting for processing. It must be said that this is not what it was designed for. However, Asp points to evidence which suggests that the cognitive processes of monitoring, selection, inhibition and execution of action are the same ones that enable a view of choice as speaker who chooses (speaker as agent). Asp's broader perspective on choice as a cognitive process allows her to claim that "some of our key meaning choices may originate in action selections 'outside' language areas". This statement captures the essence of the challenges faced when trying to model choice as meaning in social context, as will be discussed further in this Introduction.

Building on Lamb's work on bridging systemic networks and relational networks, Gil tests the extent to which choice, as a concept used in SFL, can be seen to be neurologically plausible. In order to do this, the transitivity and mood networks are interpreted from a neurocognitive perspective and the result is a view of the networks in relational network terms. There are clearly differences in the nature of the two types of network: systemic networks classify meaning potential for social communication (inter-organism oriented) whereas relational networks attempt to provide an operational model of the linguistic system of an individual. The consequence of this distinction is that systemic networks are 'realistic' in terms of an analytical theory, accounting well for potential choice, while relational networks seek to account for what is happening in the brain as a speaker produces language. Consequently, Gil shows that while a system network can be represented in relational terms, the result remains a kind of classification. Gil concludes that more research is required to show how choice, as it is understood in SFL terms, could be represented as operationally plausible.

How is choice constrained by language use?

In many respects much of the empirical work published within the SFL literature does consider how choice contributes to how a text means what it does, but the assumptions about the nature of choice remain tacit. The particular importance

of the three chapters by Martínez-Insua, Thompson and O'Donnell is that the concept of choice is explicitly theorised in relation to how it is constrained, or indeed enabled, by language use.

Martínez-Insua takes a micro-perspective to consider how textual conditions affect the choice of existential *there*-constructions. Using spoken and written data from late Middle English to Present-Day English, the concepts of choice and choosing are explored in relation to the textual condition that may determine the appropriacy of these expressions by considering their occurrence: (i) in a given context; (ii) with a given output; and (iii) at a given probability. Martínez-Insua offers important considerations to the question of how choice is constrained in use by determining whether the selection of *there*-constructions can be seen to be favoured, enabled and/or constrained by their position in the ongoing text. Her findings show evidence for a progressive grammaticalisation of 'there + singular verb', even with plural Existents. This evidence is used as an example which illustrates that choice can be used to manage diachronic change in language.

Thompson's chapter, 'Picking an Argument: Politicians' Choice of Persuasive Strategies', takes a macro-perspective to consider the effect of choice of conjunctives in the organisation of complete political texts. In doing so, he explores the different strategies employed by a range of contemporary political speakers to organise their discourse so as to maximise the potential persuasive effect. Thompson makes a distinction between choice as constraint and choice as freedom and, as he makes clear, the latter is necessarily and explicitly located within the patterns of choice associated with the register as a whole. The empirical work presented in his chapter allows Thompson to determine to what extent choice, in the system of conjunction, is or is not constrained.

An integrated perspective is taken in O'Donnell's chapter, 'A Dynamic View of Choice in Writing: Composition as Text Evolution', as he draws on computational and psycholinguistic approaches to explore linguistic choice within language. He argues that the proper home of linguistic choice is not in the text/product itself, but rather in the process of production of the text. With the use of keystroke-logging methods, he is able to capture the dynamic process of text composition. "[T]here is no backspace in the spoken world", but there is in digital language production and it marks points in written production that can reveal something about choice. It is well established now that text production is not linear: it is not something that is first conceptualised and then produced in one go. O'Donnell takes an evolutionary approach to the process of writing. Generic Structure Potential, rhetorical structure and thematic progression are used to test which one contributes to decisions about what to include in the text and how to organise it. His chapter is one of the first proposals to empirically test a model of the writing process, rather than simply describing it. He

concludes that rhetorical structure theory has the greatest explanatory potential for text production. O'Donnell also points out that if this model of writing has any resemblance to what humans actually do, then there are significant implications for the teaching of writing.

How does choice contribute to linking language and social context?

Having moved from definitions and debates about choice, to views of choice and cognition, and then to choice in language use, this section addresses the question of how choice can be defined or explained in relation to the contexts of situation and culture. The views of choice presented in response to this question concern the higher or outer strata of language, reflecting the socially oriented nature of SFL. Each chapter addresses the challenges of making explicit the nature of paradigmatic choice in social context.

Hasan explores how choice enters into considerations of linguistic interaction. The chapter explores two faces of choice in language: choice in the system and choice in the process. For Hasan, choice in process cannot be seen entirely as the individual's choice. As she explains in her work, choice must be seen in terms of context of culture: "Systemic choice as used in the description of any *language-internal unit* has no concern with individuality, freedom, will or all those other qualities that dictionaries assign to the act of choice." For Hasan, choice in SFL is a theoretical metaphor. It is a central term that "enable[s] the analyst to enter into an explicit discourse on how language as a semiotic system becomes a powerful resource for the exchange of meanings in social contexts".

Urbach builds on Hasan's view of context of culture and she explores how it can motivate language choices. According to Urbach, the notion of 'choice' needs to be clarified and operationalised more carefully in relation to context than it has been thus far in the SFL literature. It cannot simply be assumed that there is a direct match between the notion of choice and the stratum of context. Drawing diachronically on different representations of war in newspaper reporting, she takes up the challenge presented by Halliday (e.g. this volume), where he states that some of the context networks that have been proposed seem more like "taxonomies of semiotic situation types than as options in the context of culture". Urbach uses the example of tense selection in news reporting to identify contextual pressures in field, tenor and mode that seem to motivate the choice of tense. Her work is an important step in integrating context into linguistic theory.

The relationship between context and choice is further developed by Bowcher, who develops the network of choices relevant to the system of material action within the contextual parameter of field. Her work follows from Hasan's criticism that the construct of context of situation as it currently stands

is too vague and suffers from the absence of 'checkable criteria' with analyses relying instead on 'common sense'. Bowcher interrogates current context networks and examines whether the material action system does, or should, represent a set of choices in the field network. In doing so, she also takes up the significant challenge of developing and critically working with context system networks. She concludes that keeping material action as a choice in field provides, to some degree, a means of setting out the potential features which play a role in defining the nature of the activity in situations where language is involved.

The contextual parameter of tenor is taken up by Bartlett, who questions the suitability of modelling this aspect of social context with the concept of choice. In pursuing the relationship between them, Bartlett shows that non-contextual features of the environment have their effect on talk and that "it is the speakers' perceptions of such environmental features and how they can be accommodated into their wider worldview that motivate choices in construing contexts". While agreeing that contextual variables themselves fall within the remit of linguistics, he suggests that an integrated approach is needed in order to make connections with other social sciences. By drawing on the methods of these disciplines, we will be better able to model the relationship between the social and environmental and the linguistically construed variables of context.

Berry completes the discussion of contextual parameters with her interpretation of choice in relation to mode by her analysis of choices in Theme in the register of radio news and sports bulletins. In her discussion of her mini-network for Mode, she argues that "in order to choose appropriately from the semantic options, speakers and writers have to make decisions, consciously or subconsciously, about the situation". By examining the referential meaning options for what she calls the Subject Theme, she identifies two useful differences which can serve as distinguishing features for registers. These are interactional reference and vague reference. Registers seem to treat certain features as imperative rather than choice (as identified by Urbach, this volume). Berry has identified a critical area of the grammar which demands an account of the relationship between choice and context; this is the nature of Theme selection and the role of referring in the overall model.

Castel addresses the problem of how to capture genre constraints on the semantic options available in English. As a computational linguist, Castel approaches choice from within a natural language generation (NLG) framework. Using the computational version of Fawcett's Cardiff Grammar, Castel shows how the notion of preference in relation to choice can be extended to capture genre-specific constraints. His chapter outlines a formal mechanism for identifying the constraining effects that genre categories have on language production in a computational model.

How can we study choice in text?

Text analysis is one of the main applications of systemic functional theory. The final question asked in this volume relates to how we can study choice in text, and it considers what methodological approaches help our understanding of choice.

Teich proposes a practical methodology for studying choice in relation to register analysis from a specifically quantitative perspective. She distinguishes three views of choice: choice-as-option, in language description; choice-as-result, in text analysis; and choice-as-process, in applications of SFL to 'real-world problems'. Considering how we can study choice in text, Teich provides a digitally enhanced methodological basis for studying SFL's theory of register variation.

Miller and Johnson present results from their research into register-idiosyncratic features of evaluation and stance in institutional deliberative debate. As they point out, evaluation analysis can present some difficulties due to the potential for subjectivity. Their chapter presents a methodology which seeks to limit any lack of validity which might accompany these difficulties. In order to classify instances of evaluation accurately, they explain that "we need to reduce as much as possible the imposition of our own value judgements on others' ways of saying and meaning". Miller and Johnson suggest that the assistance of computer technology can be used to this effect and can help to substantiate the analysis, providing evidence for how identified linguistics patterns can be shown to be statistically 'salient'. They show that speaker choice in terms of evaluation and stance in institutional deliberative debate can be of a 'register-idiosyncratic' nature.

The understanding of the place of choice in characterising and modelling linguistic behaviour is challenged by Kappagoda. He argues that the concept of choice may be better used as a gateway to understanding the complex systems of language and text, rather than an explanatory endpoint. Using Theme analysis and analysing the method of development of the text, he examines the accumulation of Theme choices in ancient Greek. He draws on the interrelated systems of THEME, TAXIS and LOGICO-SEMANTIC RELATIONS. For example, the THEME system is used to test whether the selection of Theme in a given clause can be related to the co-text and context as he demonstrates a method of the practical determination of the Theme. He stresses that the way in which choice is conceptualised and used is very important in terms of our understanding linguistic systems and what we can claim about text.

Praxedes Filho relies on evidence from his study of interlanguage (IL) to determine whether the SFL concept of choice can offer an explanation for fossilisation. His analysis of the 'choice repertoire' of learners' IL allows him to offer a description of the systemic continuum of written IL registers. For

example, he considers how new grammatical choice becomes aggregated by learners and he demonstrates how the concept of choice can be used to describe IL in a more encompassing way. His chapter offers an important consideration of how choice can offer an improved methodologically informed approach to IL research in second language development.

Conclusion

This volume has been a very ambitious undertaking. The book in its entirety covers the concept of choice from various angles, providing a broad-ranging and in-depth account. While it fills an important and fundamental gap in the literature, it will hopefully serve as an important benchmark from which we can compare and evaluate further development of the place of choice in systemic functional theory.

The contributors of this volume have, together, brought a wealth of experience and perspective to this project. Although every author is currently working within systemic functional theory, some have broadened their interdisciplinary interests, extending the debate and incorporating views on choice which have been influenced by other related theories, computational linguistics, sociology, biology, psychology, neurolinguistics and psycholinguistics.

This volume shows that choice, as a theoretical concept, is polysemic and not fixed or restricted to one particular notion. Halliday's original insight has been shown to be theoretically robust; there is general agreement that meaning is choice and choice is meaning. However, there are tangents waiting to be developed, each one valid in its own way.

The role that this idea has in systemic functional theory is critical: a system is an abstract means of representing paradigmatic choice. In its original sense (as described in Halliday's works and indeed in this volume), choice was not developed with any designs on accounting for what an individual does, but rather on the social semiotics of communication. Nevertheless, it cannot be denied that in any communicative act, the speaker is involved in the act. This split, if we can refer to it as such, has resulted in far more attention being given in the literature to the more socially oriented semiotics on which SFL has been built. The manifestation of the concept of choice in the literature has often tended to obscure the role of the theoretical conceptualisation of choice for the individual, while at the same time introducing some degree of ambiguity in stating the claims about choice.

The point of departure for this volume was, in a sense, a critique of SFL generally. It has not sufficiently defined or discussed the place of choice in the overall theory, or the mechanism by which it operates. As an important and primary concept, it must be brought out to centre stage to be examined and debated. This is what we have done in preparing this volume. One thing

this book has shown very clearly is how powerful the concept of choice is. It has been put to the test here and it has come out showing its strength and its potential, and yet there is clearly considerable scope for further development.

What does this critical examination of choice tell us about the current state of the art and what direction, or directions, should be prioritised in future? The answer lies in part in the individual chapters, but mainly in their juxtaposition, in the sense that the various permutations and combination of specific chapters offer a significantly enhanced view over any one chapter on its own. This is a major strength of the volume. There are almost endless possibilities for such connections and unfortunately space here does not permit a full exploration of the possible combinations. As a start, we have organised the contributions in a particular way, with each section combining the scholars whose work can be seen as primarily addressing one of the key questions discussed above. However, as will become clear, each contribution addresses more than one question. Readers can approach the volume hypertextually and select chapters which answer their own questions.

We can take as given the role of choice in a paradigmatic and systemic view of language in the original sense that Halliday intended. However, it is clear that as we move to developing this theoretical concept, we need to do so both critically and explicitly, while taking forward the important ideas developed in this volume.

Part I

Choice: Theory and Debate

1 Meaning as choice

M. A. K. Halliday

Preamble

About fifty years ago, after a group of us had been working for some time towards a Marxist theory of language – one that would give value to languages, and language varieties, largely overlooked in mainstream general linguistics, such as minority languages, non-standard dialects, spoken language and informal dialogue, variant registers, and newly developing post-colonial national languages – I revisited my PhD thesis, in which I had tried to formulate and put into practice a descriptive grammar in the framework of Firth's system-structure theory. Firth once said to me that he saw nothing in his own theory that was incompatible with a Marxist approach; and I agreed with him. It seemed to me that explanations of linguistic phenomena needed to be sought in relationships among systems rather than in relationships among structures – in what I once called 'deep paradigms' – since these were essentially where speakers made their choices; and furthermore that the explanation needed to be grounded in a functional analysis, since language had evolved in the process of carrying out certain critical functions as human beings interacted with their (as it later came to be called) 'eco-social' environment. Hence the evolution of the set of practices that came to be known first as 'systemic grammar' and then, along with the explanation of language in terms of abstract functions (later 'metafunctions'), as 'Systemic Functional Linguistics' – the way it remains today.

In this chapter I will use systemic functional theory as the framework within which to discuss the notion of meaning as choice. I take this notion as the natural extension of the concept of paradigmatic relations as formulated a hundred years ago by Saussure, and theorised by Firth with his category of 'system' as that which gives value (*valeur*) to elements of structure. I will start with a short disquisition on the notions of meaning and of choosing.

1.1 Choosing to mean

All human activity involves choice: doing this rather than doing that. Semiotic activity involves semiotic choice: meaning this rather than meaning that. The

limiting case is that of choice in polarity: doing this rather than not doing it, meaning this rather than not meaning it. With semiotic activity we may need to distinguish between the two loci of polarity choice: (i) meaning this rather than not-meaning this, (ii) meaning this rather than meaning not-this.

Semiotics is the science of meaning.[1] Saussure called it *sémiologie*; but this has tended to be interpreted rather specifically as theory of the **sign**, whereas meaning, although the concept of the sign is integral to it, carries the more general sense of one of the two broad realms of human experience, the realm of matter and the realm of meaning (Saussure, 1959:16; cf. Halliday, 2005e). And 'meaning' is preferable to 'information' because information refers particularly to meaning that is measurable, whereas much of the realm of meaning cannot be meaningfully measured.

To mean is to act semiotically. The verb *mean*, in English, is the prototypical member of a small but distinctive class of verbs which move between the mental−verbal and the relational process types. Relational processes are those of 'being' and 'having', with *be* and *have* as prototypes; others include *become*, *seem*, *act as*, *represent*, *belong to*. Mental−verbal processes are those of 'thinking' and 'saying', again with these two verbs *think* and *say* as prototypes; others include *tell*, *announce*, *understand*, *believe*. The essential feature of the 'meaning' verbs is that they denote a relation of realisation which may be construed either experientially or logically. Experientially, it is construed as the relation between a Token and a Value: *red means 'stop!'*, *couloir means 'corridor'*; logically, it is construed as a relation of projection: *the delay means that there's been an accident*, *the accident means that there'll be a delay*. Compare other verbs such as *imply*, *suggest*, *signal*, *show*. If there is any relation of cause and effect, it may go either way; so if the projection is nominalised it will be ambiguous: *increase in output means more supporting services*, either 'brings about, produces' or 'demands, is brought about by'[2] (Davidse, 1996; Matthiessen, 1991).

In current English usage, the verb *mean* with a conscious meaner (a Senser) is typically associated with intention: either intention to say ('mean that': *I meant that I wasn't quite ready*; cf. *vouloir dire*) or intention to do ('mean to':

[1] I am indebted to David Butt for pointing out to me that in a recent presentation the distinguished physicist Brian Josephson remarked that what was needed now was a general science of meaning. I agree; and I would add that, while I would certainly not claim to be offering one, for some of us such a theory has been on the agenda for some time. And I take this occasion to give a more general acknowledgement to the work of David Butt, whose wise and well-informed conversations on such issues have been a source of insight and energy to me over many recent years. See, in the present context, his paper 'The Robustness of Realisational Systems' ("the system that means most to human beings") (Butt, 2008b).

[2] A maverick member of this class is the verb *realise*, now split into two lexical items: (i) mental, e.g. *I realised – my mistake / that I had made a mistake*; (ii) relational, e.g. *the underlying motif is realised as/by a succession of drumbeats*.

did you mean to discourage them?). This means that, just as you choose what to do, and what to say, you also choose what to mean. When I was studying children's early language development, it became clear to me that the child I was observing was not just learning to talk; he was learning to mean. I had to tweak the English language (ever so gently!) to be able to call my book *Learning How to Mean*; but that was exactly what it was about. The child was learning to act semiotically: to choose what to mean, and how to mean it. At first he had to invent his own resources, for example to make the choice between 'I want it' and 'I don't want it'; for this he devised a pair of iconic gestures, related to but entirely distinct from the material acts of accepting and rejecting. Then, as he mastered the principles of language, he steadily took over the modes of meaning that he learnt from the people around him – moving from this protolanguage into language in its usual, post-infancy sense of the 'mother tongue' (Halliday, 1975).

Choosing to act, whether materially or semiotically, is typically a subconscious process. But it can always be brought into conscious attention, and reflected on. Verbs such as *select*, *opt for* may suggest deliberate choosing. Choosing to mean is as natural as choosing to be or to do; but for writers, orators and teachers – and especially for actors and for translators – it is often guided, or at least modified, by design. Darwin opted for the term 'natural selection' to contrast with the deliberate selection practised by plant and animal breeders.

J. R. Firth wrote, in 'A Synopsis of Linguistic Theory, 1930–1955', "The first principle of phonological and grammatical analysis is to distinguish between *structure* and *system*" (Firth, 1968:17). These were the terms Firth used for theorising syntagmatic and paradigmatic relations in language, as these had been formulated by Saussure. Paradigmatic relations are relations 'in absentia': between a given element and others by which it could be replaced. In any one instance, one element is chosen, in contrast to others which might have been chosen but were not.

The set of possible elements in any given syntagmatic environment constituted a **system**, the elements themselves being the **terms** of the system. The system might be phonological, e.g. (system) VOICING, (terms) voiced/voiceless, in initial consonant in the syllable; or grammatical, e.g. (system) NUMBER, (terms) singular/dual/plural, in the nominal piece. The system is said to "provide values for" the various elements that combine to make up the structure (Firth, 1968:17).

Two key terms in Firth's thinking were 'prosodic' and 'polysystemic'. The prosodic principle meant that a system might have many possible domains: for example, a phonological system of RESONANCE, (terms) oral/nasal, might be located in a minimal segment (a 'phonematic unit'), but it might equally well be a feature of some larger unit – a hemisyllable, a syllable or some grammatical

Table 1.1. *Linguistic strata (modified from Hjelmslev, 1953)*

stratal order plane	environment	substance	form	
content	eco-social	semantics	lexicogrammar	↩
expression	somatic	phonetics	phonology	↩

unit such as a word. The polysystemic principle meant that there were always many systems in operation, so that just because two or more items displayed similar exponents, this did not mean that they formed part of the same system: for example, the syllable might have both initial and final consonants, some of them apparently identical, e.g. [m], [n], but these could have entirely different values: one in an initial system of m/b/p/ /n/d/t . . . , the other in a final system of m/n/ŋ/ /u/i/ə . . . ; they would not be identified at the level of phonology – there were no 'phonemes' /m/, /n/.

These principles were worked out in phonology, and might extend very generally across the language as a whole: some highly mixed languages, such as English and Thai, continue to display their history as two distinct phonological systems (Albrow, 1972; Henderson, 1951). For Firth this was all part of the meaning of a language. More significantly, perhaps, these principles could also be extended across from phonology into the lexicogrammar.

1.2 Systems and system networks

If we follow Hjelmslev (1953), we can refer to lexicogrammar and phonology as the two strata of linguistic **form**, the 'form of the content' and the 'form of the expression'. These are the two quintessentially **systemic** strata, where meanings and sounds are organised as recognisable dimensions of choice. From these, again following Hjelmslev, we distinguish the two strata of linguistic **substance**; these are the interfaces between the formal organisation of language and its material environment: the eco-social environment on the one hand (the 'substance of the content', i.e. semantics) and the somatic environment on the other (the 'substance of the expression', i.e. phonetics). These interfaces are where the environment is 'semioticised' – transformed by the human experience into and out of meaning; see Table 1.1 and Figure 1.1.

Tables and figures like these will be found in many introductions to linguistics, in different versions; they are included here to summarise the framework within which I am locating the present chapter.

The semiotic activity of choosing what to mean can be represented as selecting a path through various networks of systems. A system is "a set of things of which one must be chosen" (Henrici, 1981); if there are three things, we

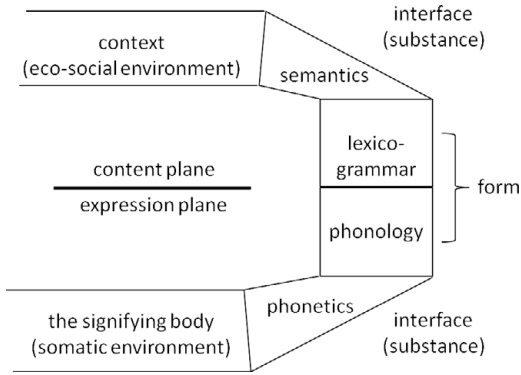

Figure 1.1. Linguistic strata (as transduction between meaning and sound)

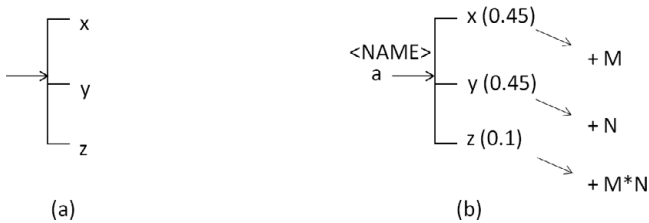

Figure 1.2. System: (a) base form; (b) expanded form (specimen)

represent this as in Figure 1.2, where the vertical dimension represents the paradigmatic axis and the arrowhead signals the activity of choosing – choice viewed as a procedure. To this we need to append three riders: (a) in a given environment, (b) with a given output, (c) at a given probability. In other words:
(a) there are specified **conditions** under which the choice is available;
(b) there is a specified **realisation** of whichever of the options is selected;
(c) there is a specifiable **likelihood** that any one choice will be made.
All these are of course specified, or are in principle specifiable, with respect to a given population: a language, or one of its varieties, dialectal or registral (cf. Matthiessen, 2010).

In any one semiotic event, many 'moments' of choice will be being activated, across many locations within the total architecture of the language. Each system is just one address within a complex network of systems, where the output of one system becomes the condition of entry to another, as in Figure 1.3; or the entry condition may involve the output of two or more other systems, either in disjunction (any one of them) or in conjunction (all of them), as in Figures 1.4 and 1.5.

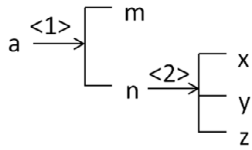

Figure 1.3. Option in system <1> as entry condition to system <2>: 'if n, then either x or y or z'

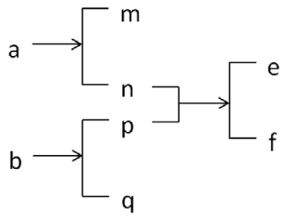

Figure 1.4. Disjunct entry condition: 'if either n or p (or both), then either e or f'

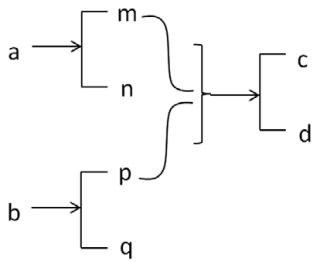

Figure 1.5. Conjunct entry condition: 'if both m and p, then either c or d'

The horizontal dimension of the network, reading from left to right, represents a progression in depth of detail, or **delicacy**.

The system network can represent any domain of activity where choosing can be analysed into small closed sets of options. This does not imply that all such sets of options will be independent of each other – in language they never are (see Section 1.6 below). The 'core' strata that can be fully systemicised in this way are those of linguistic form, phonology and lexicogrammar. If these are represented in terms of constituent structure, then the ultimate constituents (the 'smallest' units) are the phoneme and the morpheme; but these resolve into bundles of features each of which is itself one term in a system. This has always been clear in phonology, as we can see in the descriptive labelling: 'the phoneme /p/' in a given language may be characterised as a 'voiceless bilabial plosive'. This means that it combines choices from within three different systems: it is

(i) voiceless, in a system of VOICE, contrasting with /b/; (ii) bilabial, in a system of PLACE OF ARTICULATION, contrasting with alveolar and velar /t/, /k/; (iii) plosive, in a system of MANNER OF ARTICULATION, contrasting with fricative and affricate /f/, /pf/. Each feature gets its value from its place in a network of choices. The same principle holds also for the lexicogrammar. Fully grammatical constituent items ('function words', and grammatical morphemes) have always been described systemically: English nominal *-s* is plural, in a system of NUMBER, contrasting with singular realised as zero; but lexical items ('content words') can also be shown to be (the realisation of) bundles of features which are themselves organised as networks of systemic choices (cf. Hasan, 1985a; 1987; see further Section 1.4 below).

The system networks are distributed among a fairly small number of 'points of origin': structural elements that define the locations where meaningful choices are made. These form a hierarchy, known as a **rank scale**; they may vary across different languages, but within narrow limits. English is typical of many languages in the way these hierarchies are organised: phonologically as tone unit, rhythm unit ('foot'), syllable, phoneme; grammatically as clause, phrase/group, word, morpheme; with 'complexes' (clause complex, tone unit complex, etc.) in principle available at any rank. The complexes are iterative tactic structures formed by logical connections, which are themselves also systemic: thus a nexus of two clauses will open up not only the network of choices available to each clause but also a further network of logical relations – choices in the way the two clauses may be combined.

A system network is the theoretical representation of a potential, the potential that is inherent in some particular set of circumstances; since a language is a resource for making meaning, I referred to it as a **meaning potential** (Halliday, 1973). The network may be read either procedurally, with meaning as choosing (in circumstance *a*, choose either *x* or *y* or *z*), or declaratively, with meaning as choice (in circumstance *a*, either *x* or *y* or *z* is on the cards); 'system' is really short for 'system-&-process'. The network is not a schema of classification – it cannot be reduced to a strict taxonomy; rather, it offers a model, or map, of what human populations are doing when they mean. It is not a model of how their brains do it. In this respect, an entirely compatible theory is that put forward by Sydney Lamb (1999; this volume). Lamb sets out to model the neural processes involved in making meaning – in producing and receiving instances of language; his intra-organism perspective complements the inter-organism perspective that is being adopted here.

1.3 Probability and prediction

The concept of meaning as choice, or as choosing, whether or not it is being represented as a system network, may suggest a bias towards the individual

meaner: the notion of an act of meaning, in particular, carries with it a suggestion of this kind. But choosing may be an activity of a whole population, as it is when they vote in an election or a referendum. Meaning as choice can likewise be thought of in the context of a population – in the statistical sense: it may be concerned with very large quantities of acts of meaning, within which large-scale patterns and tendencies may be observed.

The network makes no prediction about what a particular person is going to mean on some particular occasion. It makes predictions about the behaviour of a population. It defines the range of options that is available to them as meaners, their meaning potential as producers and receivers in the social semiotic universe of language. And now that it is possible to observe patterns of relative frequency over a very large corpus of discourse, it can attach probabilities to each of the terms in a system – though only up to a certain degree of delicacy: there is a natural limitation here, in that for systems of greater delicacy the number of instances will be too small, and the conditioning factors too complex, to allow for any robust estimate of the probabilities involved.

There are various reasons for being interested in the probabilistic aspects of meaning as choice. One is the significance of probability as an inherent feature of a semiotic system; another is its importance for a learner construing the system, and a third is its relation to the general concept of markedness – a familiar issue in theoretical linguistics. It may be helpful to expand a little on each of these in turn.

(1) *The significance of probability as an inherent feature of a semiotic system.* When I first talked about probabilities in grammar, back in the 1970s, I met with what seemed to me a curious response: people were happy to accept variations in word frequency – that they would be likely to use *go* more often than *walk* and *walk* more often than *stroll*; but resisted, with some indignation, the proposition that they would use some grammatical features more than others – that they might choose past tense more often than future tense, for example. This, they seemed to feel, was a threat to their freedom of speech. I could only think that this might be because grammar is more deeply hidden from our conscious awareness than lexis is – it is scary to be told that you have so little control over it.

Some twenty years ago, Zoe James and I studied the quantitative profiles of two systems of Modern English grammar, POLARITY (positive/negative) and PRIMARY TENSE (past/present/future, but focusing on just the opposition between past and present) (Halliday & James, 2005). We used the COBUILD corpus of (at that time) eighteen million words, which gave us between one and two million instances of each of our two systems. We had chosen these two partly because they were relatively easy to identify automatically, and partly in order to test a hypothesis that I had formulated some time earlier, on the basis of some small samples that I had analysed manually. It had seemed to me

then that primary (least delicate) grammatical systems were displaying one or the other of two probability profiles, which I referred to as 'equi' and 'skew'. Assuming a system of two terms, in the equi type the probability of the two would be roughly equal (0.5:0.5); whereas in the skew type the ratio would be of the order of nine to one (0.9:0.1). The prediction was that primary tense would turn out to be equi while polarity would be skewed to positive.

I had noticed that these two profiles happened to correspond to two significant values established by Shannon and Weaver in their work in information theory (Shannon & Weaver, 1949). At 0.5:0.5, there is maximum information (H) and no redundancy (R) (H=1, R=0); while at 0.9:0.1, information and redundancy balance out (H=R=0.5). It seemed reasonable to postulate that this bimodal distribution of probability types might be a general property of grammatical systems, and possibly of some other semiotic systems as well.

The figures for past/present and positive/negative turned out to be close to what we had predicted – embarrassingly close, as it happened, so that we had to point out that, even if we had wanted to influence the outcome, we would not have had the remotest idea how to go about it! It is now twenty years since we carried out this study (Halliday & James, 2005), and I am still hoping that someone will follow it up. We suggested several other grammatical systems which might repay being investigated in this way.

(2) *The importance of probability for a learner construing the system*. It has been recognised for a long time that children, when they are learning their first language, typically produce the more frequent options before coming to the less frequent ones – even where the more frequent one is structurally the more complex: for example, in English, they will produce the present-in-present tense (miscalled 'present continuous') with material processes before the simple present, *we're making a picture*, not *we make a picture*. This seems very obvious; but if it is true, two things are implied: one, that there are clear patterns of relative frequency in the discourse they hear around them; and two, that they are sensitive to these patterns. The language they hear is a key component in the total experience that is ongoingly shaping their minds – where 'mind' is 'individualised brain', as it is defined by Susan Greenfield (2000). The relative frequencies become, in the shape of probabilities, a part of their language system as it develops throughout childhood and adolescence. Presumably a system with bimodal probability profiles of the kind just suggested would be easier to learn than one where the frequencies were scattered over the whole range from 0.5:0.5 to 0.99:0.01 – or one where there was no redundancy (no provision for noise) in the information patterns at all.

(3) *The relation of probability to the general concept of markedness*. We would expect the more frequent term in a skew system to be the default choice: the term that is chosen on the 'good reason' principle – unless there was good reason for choosing something else. This may vary with the register: one

noticeable feature of register variation in language is that there may be a reversal of marking, whereby a term that is less frequent in other types of discourse becomes significantly more frequent in one particular register. Familiar examples in English include negative polarity, in texts of prohibition and warning; future tense, in weather forecasts; imperative mood, in instructional texts such as recipes (cf. Halliday & Matthiessen, 1999). Passive voice is often said to predominate in scientific texts, but I don't think that has been shown to be a significant quantitative effect.

In such cases, a global 'exception' (a minor motif in the overall selection of meaning) becomes a local norm. While the meaning potential of the system remains the same, the probabilities are reset; it is this that gives the register its distinctive 'cut', or semantic style, while clearly identifying it not just as a **text type** (a set of similar instances) but as a functionally motivated sub-system within the language.

We need more quantitative data before we can attempt to give a general account of register variation in probabilistic terms. But it seems clear that the particular frequency patterns that we find in a corpus of texts – as well as the fact that such patterns appear in the first place – are not the random effects of numbers of people all behaving as individuals. They relate to the general nature of the human condition, and to the part played by meaning in human life. It does not take fancy guesswork to predict that positive will turn out to occur more frequently than negative; whether in making sense of and controlling your environment or in getting on with your family and neighbours, positive meanings are usually going to be more effective than negative ones. In other words, the probabilities are an inherent feature of language itself. That is the reason why the characterisation of a system as a set of choices included the rider 'and with a certain probability attached to each'.

1.4 Not choosing – or choosing not to choose?

When we come to talk about not choosing, we have to ensure that every system has a name. Most have, though there were some surprising gaps. Working on my PhD thesis in 1952, I needed a name for the choice between positive and negative; I couldn't find one, so I introduced the term 'polarity'. Structuralist grammars made relatively little use of system names, instead building the discussion around names of features; hence if polarity was thought of it was called 'negation'. But a feature gets its value from the system in which it figures as a term: in other words, from its paradigmatic context, that of what might have been chosen but was not. The system network is a map of this virtual environment, the constellation of related systems from which any one feature acquires value in the overall meaning potential.

It is easier to illustrate this general principle from phonology, where more or less every item can be analysed as a combination of choices from within a small number of closed systems. For example, the Mandarin syllable written in Pinyin as *qiān* is a combination of seven systemic features:

1. [ALIGNMENT] palato-alveolar, not palato-labial / *quān*
2. [MANNER] affricated, not fricative / *xiān*
3. [VOICE ONSET] late, not early / *jiān*
4. [POSTURE] palatal, not velar / *qiāng*
5. [RESONANCE] nasal, not oral / **qiāi*
6. [APERTURE] open, not close / *qīn*
7. [TONE] high level, not rising or falling—rising or falling / *qián*, *qiǎn qiàn*.

Features (1)–(3) represent the initial state, (4) and (5) the final state, and (6) and (7) the trajectory between them. The syllables following the slash are those which differ in respect of just the feature selected; **qiai* is not found, and can be shown to be a systemic (non-random) gap when the total network is drawn up (see Halliday, 1992b:118).

In lexicogrammar, the guiding principle has always been that 'grammar' is choice within closed systems, 'lexis' is choice among open sets; but this must be qualified in two ways. First, there is in fact a continuum in the domains of lexicogrammatical choice, between the two poles of closed system and open set, with some sets of 'function words', such as prepositions, and of more or less grammaticalised 'content words', such as temporal adverbs, ranged around the middle of the cline. Secondly, the notion of 'open set' needs to be unpacked, as already remarked: if instead of thinking of such sets as consisting of items of vocabulary we think of them as consisting of lexicogrammatical features, just as in phonology we unpack syllables, hemisyllables or phonemes into phonological features, then they too turn out to be closed. The lexical item, or 'lexeme', is the conjunct realisation of a bundle of systemic choices. This deconstruction of lexical items into components has been familiar for a long time, for example in componential analysis, where kinship terminologies could be readily analysed into closed systems of sex, kin type, generation and so on (see Lounsbury, 1956; Frake, 1961); but the systemic principle was not extended to the vocabulary as a whole. This step was taken by Hasan in her explorations into 'lexis as delicate grammar', where she showed that in the domains of lending and borrowing, and of dispersing and distributing, in English, each of the verbs that functioned as Process within the clause was the realisation of a bundle of systemic features; and that these systems could be derived by moves in delicacy from the experiential system of transitivity in the clause (Hasan, 1985a; 1987).

Whenever something is chosen, something else is not chosen; that is the meaning of choice. What is not chosen, but could have been, is the meaning

of that particular instance of choice. When we ask the question 'why did the speaker say that?', what we want to know is why that, why not this, or the other. What difference would it have made if the speaker had chosen something else? We can consider each choice independently, pinpointing it in terms of one system at a time.

Greaves and I attempted to do this in our book on English intonation, asking at various points why the speaker had chosen that particular tone, or that particular rhythmic pattern, and what difference it would have made if he or she had chosen the other one, or another one, instead (see Halliday & Greaves, 2008).

But is it always the case that choosing something means not choosing some alternative – that 'choosing x = choosing not y' – or can one simply choose not to choose? This question comes into our consciousness when the grammar dictates that some unwanted choice has got to be made, perhaps from some kind of outside pressure being exerted on the language. At the end of the previous paragraph, for example, I didn't want to choose between masculine and feminine in the pronoun functioning as Subject; so if I wanted to ground my discourse in the sex-conscious language of today, I had to resort to "he or she" in order to get out of the choice – or I could have slipped into the plural and said 'if they had chosen . . . '. Usually, though, we are not aware of avoiding unwanted choices. For example, if I said to you 'Knowing that, I do think you should . . . ', I am choosing not to choose (a) the type of dependency ('because/if/when/although'), (b) the Subject ('I/you'), or (c) the primary tense ('know/knew'). By using the non-finite clause *knowing that*, I have closed off all the options that derive from the selection of finite.

The system network will make a distinction between 'choosing not (x or y)' and 'not choosing between x and y'. But the difference is not easy to generalise, and is often obscured under the name of 'unmarked': is the unmarked choice one term in the system, or is it that the system is simply not being entered? For example, in the temporal systems of the Mandarin clause, is the formally unmarked option 'unmarked aspect', i.e. a third term in the aspect system, and hence excluding the other two terms (perfective/imperfective), or is it 'unmarked for aspect', staying outside the aspect system altogether? These alternatives would be represented as in Figures 1.6 and 1.7.

In Figure 1.6, the unmarked option is a term in the aspect system, excluding both the other two; in Figure 1.7, if the unmarked option is selected, the aspect system is not being entered. Here we might prefer the version in Figure 1.6, on the grounds that in the negative the unmarked form clearly excludes the meanings construed by either of the two perfectives (roughly, unmarked *bù lái* 'doesn't come'; perfectives *méi lái* 'hasn't come', *bù láile* 'no longer comes').

The issue arises at a lower rank with the representation of features that are realised in lexical items, for example in the numeration of nouns in English.

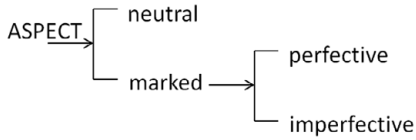

Figure 1.6. One possible interpretation of the Mandarin aspect system ('unmarked aspect')

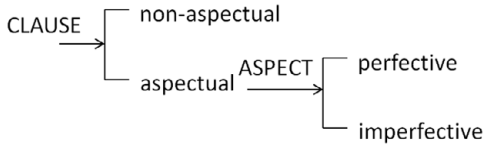

Figure 1.7. Another possible interpretation of the Mandarin aspect system ('unmarked for aspect')

Figure 1.8. Two possible interpretations of the English number system

Where there is a distinction between 'count noun', like *cow*/*cows*, and 'mass noun', like *cattle*, the mass noun does not enter into the numeration system: some will appear as singular, like *this livestock*, others as plural, like *these cattle*, but there is no opposition between the singular and the plural; whereas a word which is simply without a formal distinction, like *sheep*, represents a third term within the numeration system – in this case not 'neither' but 'either' (*this sheep*, *these sheep*) (see Figure 1.8).

It may often happen that the unmarked term, which typically involves a smaller number of choices, is also the more frequent in most varieties of the language. But this is not always so; a contrary example would be that of finiteness in the English clause, already referred to, where finites are almost always found to outnumber non-finites. Speakers do not seem to mind how many acts of choosing they undertake.

1.5 How many choice points?

A system network at the lexicogrammatical stratum is likely to generate a very large number of selection expressions. The network for the English verbal group which I prepared many years ago (Halliday, 1995a), and which was by

no means exhaustive in delicacy, generated about 72,000 selection expressions for any verb having both active and passive forms. An instance of one of these would be:

//1+ . . . might / **not** have been / going to get / paid . . .

from the clause nexus *You might not have been going to get paid if you hadn't asked about it*. Here the selection expression would be:

FINITENESS: finite; DEIXIS: modal; VALUE: low; ANGLE: oblique; (DEIXIS) TYPE: modalisation; SECONDARY TENSE: + : non-present: past / + : flip (=future); CONTRAST: + (= contrastive); LOCATION: auxiliary; KEY: simple; DIRECTION: known; FORCE: strong; POLARITY, POLE: negative; MARKING: marked; VOICE: passive; (PASSIVE) TYPE: mutative.

Each of these selections makes some contribution to the form of the final output.

It used to be objected that to have to select from nearly a hundred thousand options every time you use an English finite verb would be way beyond the capacity of the human brain. I am not so sure that it would; but in any case the comment is misjudged. You probably know, say, 25,000 English words if you have been using the language regularly throughout your life; but you don't search through the dictionary every time you choose a noun or a verb. If you want an analogy, it would be more like searching through a thesaurus, of the prototypical kind as devised by Peter Mark Roget.

In Roget's *Thesaurus* (Kipfer & Roget, 1992), it takes only ten steps (acts of choosing) at the most to get from the main divisions to the smallest list of terms, that between commas; no more than thirteen to fifteen steps to reach any one particular item. Moreover, many words occur in several different places to accommodate their different senses: *cut*, for example, appears in twenty-seven different environments; so in any one traversal you have gone further than selecting one lexical item – you have selected one particular item in one particular use. The number of steps is of the same order of magnitude as are involved in selecting one of the forms of the English verbal group.

These 'steps' are the nodes, or choice points, in a system network. The English verbal group network, referred to above, has twenty-seven choice points; the maximum number that could be traversed in one single path through the network is twenty-three, of which thirteen are independent of each other, the remaining ten being related by inheritance. A minimal path through would involve just seven choices.

As already remarked, it is not being suggested that this is how the brain goes about performing an act of meaning, whether productive or receptive. Very little brain energy is used up in making familiar, high-frequency choices; we enrich the network by showing at least some relative probabilities, on the basis of corpus evidence, but this is not telling us how the processes are taking place in

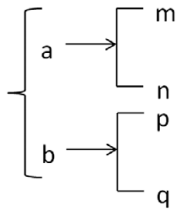

Figure 1.9. Two independent systems (all four combinations mp, mq, np, nq possible)

the human brain. The system network is one explanatory device – an 'abstract tool' – in a function-oriented theory of meaning: it is an abstract representation of the meaning potential, in which describing something consists in relating it to everything else. Since meaning equals choosing, description and agnation are one and the same process, not two separate processes as they have generally appeared in more formally orientated models.

All systems in the same network are agnate to one another, and it is possible to quantify the degree of separation in terms of the number of steps from a common point of origin. Given any pair of systems that are adjoining, the significant variable is whether or not they are independent of each other: is each choice made separately, so that all combinations are possible, as in Figure 1.9, or does the choice in one determine access to the other, as in Figure 1.3?

If all relationships were of type 10 then a network of twenty-seven systems, supposing all to be binary choices, would yield 2^{27} possible selections. This of course never happens; the typical picture is more like that for the English verbal group, where a network of twenty-seven systems yields about 2^{16} possible combinations of choices. But the dependence may be extremely remote; so our grammatics gives a more realistic picture by separating out the different structural units – those of different rank and different primary class, such as clause complex, major clause, verbal group, nominal group – and treating each as the point of origin of a separate system network. Dependency between networks is shown in the form of 'preselection' (see Matthiessen, 1985).

Historically, there is a tendency for systems in language to move from type 3 to type 10: that is, for choices to become more independent of each other. This is probably the single most effective device whereby a language increases its meaning potential. As shown in the networks, this dissociation of associated variables looks like a considerable leap; but that is an artefact of our representation, which offers only a simple opposition between dependent and independent, whereas what is needed is a cline, recognising degrees of association between systems (Nesbitt & Plum, 1988). This in turn is one manifestation of a more

general problem, that of theorising indeterminacy on both the paradigmatic and the syntagmatic axis. Linguistic boundaries on both axes are inherently fuzzy, and we need to model the gradation between 'same' and 'different' to understand how meaning evolves.

We can often find principled criteria for drawing the boundaries and 'digitalising' an analogue system. In English, degrees in the system of MODALITY, which is the cline from 'yes' to 'no' (*is*/*isn't*, *do!*/*don't!*), are bounded in the lexicogrammar because they are **worded**: *possibly*/*probably*/*certainly*, *may*/*will*/*must*, etc. But the related system of KEY is not worded, it is realised by intonation; one of its dependent systems is realised as the extent of the fall in pitch in the tonic segment of a tone 1 tone unit, ranging from 'high fall' (high to low) to 'low fall' (mid-low to low). This is a continuous variable; but it can be resolved into three distinct secondary tones by reference to the pretonic segment of the tone unit, according to where the fall starts. It may be (i) above, (ii) at the same pitch level as, or (iii) below the final pitch of the pretonic; this gives a system of three secondary tones, high fall / mid fall / low fall. When we observe their role in dialogue, we can interpret these as the realisation of three terms in a grammatical system of FORCE, 'strong/neutral/mild'. Here there are clear criteria for reducing the continuum to a digital three-term system (Halliday & Greaves, 2008).

This procedure is analogous to that of handling indeterminacy on the syntagmatic axis; for example, establishing boundaries between tone units, or between clauses. It contributes to the general tidiness of the description. But it can be somewhat arbitrary; and it does carry the message that indeterminacy is somehow exceptional, whereas it ought to be seen as the norm for systems and structures in language, and probably some other semiotic systems as well. Continuous choices are entirely normal, and take various different shapes and sizes. They are not, on the other hand, evenly distributed around the semantic space that is created by language.

1.6 Choice and metafunction

In the end, the nature of choice in language – the variety, and the scope, of the choices that make up its meaning potential – is defined by what language has evolved to do: in other words, by its **metafunctional** foundations. Ideationally, as the theory of human experience, language had to reduce the material environment (and, ultimately, the semiotic environment, that of human consciousness) to a finite number of discrete choices and choice points. Interpersonally, as the manager of human relationships, language had to organise social interaction into choices of a different kind, still a finite number but rather less discrete on both axes. And it had to do all this in such a way that the two sets of choices were freely combinable: both with each other and with a third set of choices, the

textual, which gave value to the text and its components as a flow of coherent discourse (see Halliday, 1970).

So language evolved in such a way that, in principle, the speaker can put any spin on any topic at any discursive moment. Ideational, interpersonal and textual choices are largely independent of each other. Now, if all these different choices had been realised as constituent structures – as formally and functionally distinct parts of some larger whole – it would have been extremely complex to accommodate any great variety of combinations. But, while other types of structure can be reduced to constituency in order to simplify the description, that is not really how they work. Ideational meanings **are** largely based on constituency: they involve experiential configurations of distinct structural roles, and tactic arrangements of these in logical sequences. But interpersonal meanings tend to be spread over indefinitely long and rather ill-defined passages of speech, as connotative colouring or timbre; while textual meanings are often ordered at intervals, at beginnings and endings, giving rise to a kind of oscillation between peaks and troughs of prominence. These are only tendencies; neither the metafunctional systems themselves nor the structures associated with them are sharply differentiated. But because these are such different modes of expression they readily combine, allowing for maximum freedom of choice within each of the sectors of meaning.[3]

Given what is now known about language and the human brain – how they co-evolved in the human species, and how they develop in the individual child – the metafunctional foundations of meaning appear natural: neither the fact that there are meanings of different kinds, nor the types of construction that are preferred by each kind, seems to be dismissible as arbitrary. And in coping with the ever-increasing complexity of our interaction with the eco-social environment, the ideational and the interpersonal sectors are equally involved. Neither has priority, and we cannot mean in one sector without at the same time meaning in the other. Linguistics has tended to assign priority to the ideational, both to its domain of meaning, based on reference, and to its mode of expression, based on constituency; these are more readily observed and categorised, and there is a clear distinction into which meanings are lexicalised and which are grammaticalised. Interpersonal meanings tend to be organised in more fluid

[3] We could draw a (not too serious) analogy with physical systems:

experiential meanings tend to be realised as	particles
interpersonal experiential meanings tend to be realised as	fields
textual experiential meanings tend to be realised as	waves
logical experiential meanings tend to be realised as	strings

(But it may not be too far-fetched to see the same elementary forms of structure in the realisation of semiotic systems.)

patterns, often in that intermediate space where grammar and lexis merge. Martin has shown how the various systems of 'appraisal' in English (attitude, engagement, graduation) are construed as sets of semi-grammaticalised lexical items; the boundaries between them are fuzzy, and there is much room for variation among individual speakers (Martin & White, 2005). Meanings of this type have generally been pushed into the background, or even ignored altogether, especially when the prevailing view of language was that it simply 'put into words' meanings that were already there, packaged and lined up in some semiotic warehouse called the mind (see Deacon, 2010; Dunbar & Shultz, 2007; Greenfield, 2000).

The picture becomes more balanced when we see language for what it is: not as the **expression** of meaning but as its **source**, the meaning-creating **semogenic** capacity which is driven by, and drives, the human brain. Every act of meaning involves choosing in all three metafunctions; the lexicogrammar has the job of melding these choices into a single, coherent flow of discourse that creates meaning as it unfolds in time. With our grammatics, we can 'unpack' this discourse flow into its component strands, or currents. But here again we find ourselves using constituent structure as the model, to which all other types of structure can be reduced. When the act of choosing takes shape, when it is realised in sensible form, the patterns that emerge are all, at some level of analysis, smaller parts making up larger wholes. Both interpersonal and textual meanings are in a sense co-opted into this dominant pattern.

In fact both these metafunctions do make use of constituency, and in some of their systems this feature clearly predominates. The interpersonal system of modality, for example, is realised in many languages by discrete elements occurring in definite places within a structure; the prosodic effect is achieved by repetition of the same or similar meanings over an indeterminate passage of discourse. There are after all only a limited number of possible structural types. But this can lead to metafunctional conflict, where different semiotic pressures clash. Here English and Mandarin offer some quite similar, closely parallel, examples. Ideationally, both these languages use 'word order' (i.e. the ordering of the elements in a clause structure) in the realisation of experiential meaning; and both are so-called 'SVO languages', so that in a two-participant clause the order is Agent ^ Process ^ Medium – in transitive terms, Actor ^ Process ^ Goal (where ^ means 'is immediately followed by'): *dog bites man*, *gǒu yǎo rén*; *man bites dog*, *rén yǎo gǒu*. At the same time, both languages make use of word order as one realisation of textual meaning: in the system of FOCUS, the favoured sequence is that of Given ^ New, with focus on the final element. So in a clause with two participants, these principles conspire to map the New on to the Goal; but if the speaker chooses to focus on something other than the Goal, the two conflict.

There are various resources in both languages – systems of VOICE, in its broader sense – for varying the mapping between experiential and textual roles in the clause. The Goal may be put first, as Theme, and the Actor either omitted or in some way brought into prominence: English favours the passive, Mandarin the *shì . . . de* 'it was . . . who/what' type of predicative, though both languages have both. But suppose it is not a participant but the Process itself that the speaker is choosing as the point of focus in the clause. It is possible in both languages to assign tonic prominence to a non-final element; but this carries a flavour of markedness, which may not be the speaker's choice, in which case the verb has somehow to get to the end of the clause. Here Mandarin and English have evolved similar, more or less complementary, strategies: each splits the verb into two parts, though they do it in different ways. Mandarin uses a pre-verb *bǎ*, originally a lexical item 'take hold of' but now fully grammaticalised, though only fairly recently extended from material processes to other process types. For example,

qǐng nǐ bǎ zìjǐde fángjiān shōushí hǎo
[please you bǎ own room tidy up]
'please tidy your own room up'

English uses the device of the phrasal verb, splitting the Process into Event and completive Phase. Thus each language has its way of resolving the contradiction between the two metafunctional pressures on final position in the clause.

1.7 Meaning beyond the core

I have largely restricted the discussion to the 'core' strata of language, lexicogrammar and phonology; and mainly to the lexicogrammar, Hjelmslev's 'form of the content', which is where the sense of 'meaning as choice' is most immediately perceived. Here the meaning potential is most fully systemicised. This is what grammar and phonology are about: ordering the processes of meaning, both 'content' and 'expression', into manageable networks of interconnected choice.

But to mean is always to choose, wherever we intercept the chain of realisation that constitutes the stratal hierarchy, even if we cannot systemicise it all the way. We may not always, at all the steps, be able to resolve the act of meaning into a network of oppositions between choosing and choosing not; but there is only one act taking place. It is an extraordinarily complex act; it is hard to analyse out, because there is no arrow of time in it – the strata are not linked in any kind of causal sequence. They are the stages that we, as analysts, set up along the route between meaning as sense and meaning as sound, so that we can track it through its various transformations.

The analytic stages are not arbitrary, even though there is a considerable amount of 'play' in where we can choose to set up our boundaries. Somewhere between the lexicogrammar and the context – the significant eco-social environment – we recognise an interface stratum, that of semantics, Hjelmslev's 'content substance'. Here the principle of organisation, following Martin and Matthiessen (1991), is not typological, as in the lexicogrammar, but topological; it is based on semantic domains, or realms of shared experience and interaction, whose formal reflexes may be scattered throughout the lexicogrammatical networks. A critical manifestation of this stratal boundary is provided by metaphor, both lexical and grammatical. Metaphor is a cross-coupling between the semantic and the lexicogrammatical, and therefore a rich resource for expanding the overall meaning potential.

Can one network the semantics? This question arose in a vivid fashion when Hasan set up a programme of research to examine the thesis that Bernstein had put forward in his theory of 'socio-linguistic coding orientation', more generally known simply as 'theory of codes'. In his essays in the sociology of education, based on a large body of data from interviews with schoolchildren, teachers and parents, Bernstein had proposed that children from different social backgrounds had experience of different meaning styles, and that this might account for different responses to schooling, leading to different levels of educational success and failure. As a linguist, Hasan knew that enquiries of this kind had ultimately to be based on natural speech in interactive situations; so she recorded some 60,000 clauses of conversation between mothers and their 3½- to 4-year-old children. Together with Carmel Cloran, Hasan analysed about one-third of this corpus semantically, in terms of semantic networks that she had herself drawn up. The results were subjected to a statistical analysis of variance, based on principal components; the analysis showed highly significant results along the lines that Bernstein had predicted. Hasan's work was a model of quantitative research not just in linguistics but in the science of meaning in general; it also demonstrated very convincingly that semantic choices can be represented as networks of systemic options (see Hasan, 1996b).

With semantics, we are still locating ourselves squarely within language. What of other semiotic systems? The stratum of context, Firth's 'exterior relations of language', is treated by researchers in Systemic Functional Linguistics as falling within the domain of a linguistic theory; some context networks have been proposed (e.g. Hasan *et al.*, 2007:724), but these appear rather as taxonomies of semiotic situation types than as options in the context of culture – and the former may well be their main theoretical value. Other, non-language, semiotic systems, as these are instantiated in the form of tables, charts, figures, plans, graphs, maps and formulae, tend to be designed so as to display meaning as choice, though not always in digital form; and they can often be 'read off'

as verbalised text – though not uniquely, because their stratal location is in semantics, not in lexicogrammar.[4]

Other semiotic 'texts', whether visual, such as images and film, or in a different modality such as music, bear a more distant, indirect, relation to language. This does not mean that they cannot be illuminated by a linguistic theory; on the contrary, as O'Toole has shown in his highly original and imaginative excursus into the language of the 'displayed arts' of painting, architecture and sculpture, a great deal of additional insight is gained by using the concepts and methods of systemic linguistics to describe and analyse these artefacts (O'Toole, 2010). Since the clientele for whom they are displayed also have language, this may turn out in the end to be the most effective way of explaining them. But that must be left open until there have been more attempts at theorising these other semiotics in their own terms – probably still using language in order to do so.

Perhaps the most significant case is that of Sign, the cluster of highly evolved semiotic systems used by communities of the deaf. Sign languages are a form of language; they are readily translatable, as we can see at any time, into and out of language in its auditory mode. But it is not just the mode of expression in Sign that is different; the choices in meaning are also in certain respects distinct. Because it is constructed as location and movement in space, the meanings in Sign are less categorical: Sign regularly construes as clines not only qualities but also entities which in auditory language form discrete sets. There are two conflicting pressures on Sign languages: on the one hand, the distinctive meaning potential created by the visual−gestural modality tends to increase the distance between signing and speaking, while on the other hand the constant interaction between the two communities, even within the same family, and the large number of bilinguals, serves to maintain the underlying unity of the two as variants of the same semiotic. Most research into Sign has foregrounded the study of features at the lexicogrammatical stratum, and that especially in the context of comparison with spoken languages. But the choices in meaning that are available to a signer – the meaning potential **potential**, so to speak – are in many ways significantly different, and if these can be represented in the form of semantic networks we might learn quite a lot more about the semiotic resources latent in human language (see Johnson, 1994:3911−3923, and the other articles on Sign languages in the Asher volume, Vol. 7, pp. 3890–3927; also Johnston & Schembri, 2007).

Any act of choosing creates value. Linguists such as myself have stressed, in our work, the semogenic power of language. Language creates meaning, and that is how it enables us to construe our reality and enact our social processes.

[4] For an illuminating account of the meaning potential generated by one specialised discipline, in this case mathematics, see O'Halloran (2011).

This meaning-making power of language is activated by the choices we make – or rather by our 'choosings', processes operating as virtual things. We make meaning by choosing; and by the same token, every time we make a choice we also change meaning – we perturb, however slightly, the total meaning potential. It is this that prevents our meanings from degenerating into vacuity – from becoming items in a semiotic supermarket, with ten thousand options but no choice.

Does this seem to imply some sort of intention on the part of the meaner? Not at all, in the sense in which 'intention' is usually understood, as conscious design directed towards a foreseeable outcome. It is more like taking part in an evolutionary process in which the totality of semiotic activities on the one hand maintains and supports the existing eco-social order while at the same time, on the other hand, nudging it in the directions in which that eco-social order is going to change – is in fact already changing. I believe the term 'motivated selection' could be used to describe this phenomenon (cf. Butt & Lukin, 2009: esp. 192–194). It is this that gives significance to the large-scale, far from random, quantitative patterns that characterise language as a probabilistic system, and so mark out the processes of meaning as the most powerful manifestation of human choice.

2 The teleological illusion in linguistic 'drift': choice and purpose in semantic evolution

David G. Butt, Alison Moore and Kathryn Tuckwell

> . . . if this drift of language is not merely the familiar set of individual variations seen in vertical perspective, that is historically, instead of horizontally, that is in daily experience, what is it?
>
> (Edward Sapir 1921:154–155)

> I have called this principle by which each slight variation, if useful, is preserved by the term Natural Selection, in order to mark its relation to man's power of selection . . .
>
> (Charles Darwin 1998:88–89)

2.1 'Choice': a problem, an opportunity, and a proposal

Linguistic models of all varieties have invoked the notion of 'choice', whether explicitly as in Systemic Functional Linguistics (SFL) or implicitly through various fundamental concepts like 'paradigm' and 'associative axis', 'agnation', or even 'optional' versus 'obligatory transformations'. The idea of choice as 'meaning potential' seems congruent also with the experience of language: as Halliday (this volume) has put it: "All human activity involves choice: doing this rather than doing that . . . meaning this rather than meaning that."

Furthermore, the assumption of 'purpose' implicit in 'choice', or of a more narrowly understood 'goal-orientation', is the heuristic device by which most linguistic theory has been elaborated: that is, by which it has been turned into detailed description. Registers and even literary genres are pragmatically defined, or at least given their 'family resemblance' characterisations, in terms of general social functions, cultural tasks, community transactions (Greek *pragma*: 'the business to hand'). These functions are declared further by the phases, elements, stages or moves which constitute the process of completing such transactions. At the level of lexicogrammar, one can see mood systems, as described in the terms of the traditional Western grammars, as a spectrum of human 'strivings' to affect others, namely, by *indicating*, *declaring*, *interrogating*, *wishing*, *hypothesising*, *commanding*, *seeking agreement*, etc. Even

the common inclusion of 'infinitive' in the mood classifications bears out categorisation by purpose: these are the clauses that have, as yet, no designated task in the finite world of human 'purport'. Linguistics has been crafted out of a reflexive stance to the goal directedness of communicative behaviours. The evidence includes the continuity of Rhetoric into the twentieth-first century – explicitly developed as it was by Aristotle as a 'science' of linguistic persuasion.

These inherent assumptions of 'choice' and purpose in linguistic theory have been variously characterised and addressed across the history of linguistics, with Sapir's discussion of linguistic 'drift' (1921:154ff.) an important case of a linguistic titan attempting to reconcile the vertical (diachronic) study of change with the horizontal (synchronic) experience of using and observing language (see Joseph & Janda, 2003, for many insights about the problems of such reconciliation: e.g. see the history of 'went/go' as discussed in their introduction: p. 109). The key issue for our discussion is the teleological implication of needing (or feeling the need) to impute to the drift in language "a certain mystical quality . . . a power to change of its own accord over and above the involuntary tendency of individuals to vary the form" (Sapir, 1921:154). Sapir's questions highlight lacunae in our own natural science of language – in particular, the fact that, in the hands and minds of humans, variation is not merely random – variation means correction or adaptation to immediate purpose, not just incremental errors in the transmission of the 'code', not just errors which are (re)selected, post hoc, for semantic efficacy. One might counter here that Sapir is actually highlighting the 'demands' of a language system overall: namely, that the complex, 'polysystemic' ensemble that is a language (as emphasised by Saussure, 1959:99–125, from one point of view, and by Firth, 1968, from another) will only change in accordance with certain systemic principles, and that we are unable to distinguish those waves that Sapir (1921:155) said will "outline the tide".

What is not so clear, in any case, is how we fit 'choice' and its corollary of 'purpose' into our scientific cosmology. The abstract, semiotic tools of humans – with language at their core – present a particular problem for natural scientists, in fact for all of us trying to elaborate the Darwinian vision: namely, the challenge to imagine the creative variation – the 'grandeur' as both Darwin and the poet Hopkins conceived of it – that is possible through 'evolution under natural selection'. While linguists are not obliged to resolve all the conundrums surrounding living systems, neither are we to persist in denial of the wider framework with which our work needs to be consistent.

We argue that systems of language offer a peculiar opportunity to analyse the properties of complex systems, in particular systems which have emerged as a form of 'mental tool'. For instance, language (the ultimate mental tool) is a system, produced by minds, and which directs the growth of brains and minds!

But the question arises: How do we 'direct', or 'intervene' in, that growth or emergence? Does 'human' selection play a role, rather than 'natural' selection alone? If so, who appears to experience or exert any such control over the direction by which a language grows? Sapir pointed out, in this regard, that we come close to imputing a mystical character to language drift: no one has any reliable sense of where it might be heading at any given time; but with hindsight it appears that the developments have a logic about them, with a higher degree of overall functionality through the change. Vague expressions like the "genius of the language" attest to this conundrum (Sapir, 1921:154ff.). So too, more technically elaborated uses of teleological expressions have also complicated the construal of change in linguistic systems (see 'teleonomy' and the spectrum of issues raised by Jakobson, 1973: esp. 44–63: feedback; means/ends models; system thinking; the 'syntax of DNA'), many initiated by the conceptual work presented in Rosenblueth, Wiener and Bigelow in (1943): these are surveyed in Butt, 1977). These teleologically oriented expressions have to be evaluated both for their linguistic plausibility, and in the light of biological arguments from Gould, Lewontin and others concerning the degree to which functionality may be overstated 'post hoc' in evolutionary thinking (see, for instance, Sterelny & Griffiths, 1999:224ff.). Keeping this caveat in mind, we believe, nevertheless, that Sapir had seen degrees of order in the complexity of language that were not plausibly explained by mere random mutations in the coding behaviour of humans. Furthermore, we see Sapir's insight as a form of 'pre-science' with regard to contemporary understanding and evidence in human sciences, and potentially more widely, as an exemplum for biology.

Recent evidence suggests that the concepts of slow, uniform, random mutations and of genetic determinism may have been extended too far when applied to all the experimental results from enquiries of change in nature. In particular, the limits emerge in reference to information exchange and innovation – in cells; in bacteria; in the construal of consciousness; and in the products of human minds (viz. Shapiro, 2011; Margulis, 1998; 2001; see Section 2.4).

The problem of choice in linguistics creates a tension in our science of linguistics: How do we create a natural science of meaning that is commensurable with the empirical evidence of how we use and adapt our linguistic behaviours across time and across registers? But the tension is not simply an impasse, or an embarrassment. It is also an opportunity, a chance to transact with sciences beyond the scope of linguistics: linguistics has to confront the developments and problems of biology; and by doing so, as in the case of Sapir, linguists may highlight aspects of systemic complexity ahead of their clarification at micro and global scales in other disciplines.

The opportunity follows from the special conditions that pertain to language and its character as a complex system:

(a) language is a living system that is both embodied and exosomatic, depending on how we approach and organise its data into its many modes of expression.
(b) language functions between members of a 'community' and is legislated collectively, and this case of extended mind has directed the evolution of our human form (viz. the vocal mechanism: e.g. Lieberman, 2000), and appears to continue in this consequential role. One yet to be fully explained instance is the reorienting of human brains to a greater facility with managing decontextualized, formal operations, as attested to by the Flynn Effect, the hyper-inflation in only some facets of mental performances in IQ results since 1947 (Flynn, 2007). This anomaly in these extensive archives of measurements of human cognitive performance is precisely what one might have predicted on the basis of Halliday's explication of the upward 'slope' of nominalisation and grammatical metaphor in English. Such dramatic intensification of the process of abstraction has been explored through time (from 1380) and across cultures (especially English and Chinese: e.g. Halliday & Matthiessen, 1999). Evidence for, and quantification of, this dramatic intensification of lexical density are discussed by Mair and Leech (2006), and set out in Biber and Conrad (1999).

It is as if language places our most intricate evolutionary history on display, our history as it has changed both within and beyond our bodies, as the result of our human transactions out to the world. It is in this way different from the immune system, or the organization of neurons in the brain (the two specialisations of Edelman (2006; Edelman & Tononi, 2000) in his theory of 'neural Darwinism'). In addition, one cannot think of questions of consciousness without implicating language. But the investigation of consciousness through language demands semiological, rather than surgical, tools. As the business of language is conducted between people, it has no single, central locus beyond the acts which memory secures and which new acts confirm. It is a dispersed phenomenon, a characteristic shared with objects of many complex forms of enquiry. On the one hand, language allows us to pursue, in detail, a wide spectrum of what we call creativity, novelty or innovation. On the other, it is the quintessence of that mysterious notion: habit.

The **proposal** to which this chapter is working might be summarised as follows. It involves a modification of the Russian 'Formalist' concept of 'motivated selection'. The force of the proposal is to extract from text the latent patterns which involve a semantic consistency which could not be rationally described as random. The patterning is most significant when it can be demonstrated across domains of meaning potential with very unlike forms of exponence, that is, with contrastive ways in which they are manifested. This is to claim that semantic concord between selections is all the more remarkable because the manifestations are not overtly related. Whether such patterns of semantic

concord are intended, whether they are conscious, or unconscious ('automatised'), is beside the point. The drift of textual selection is evidence that the 'second nature' that humans take on increasingly as their first nature – their meaning system – is providing them with a domain for cryptotypic, adaptive behaviour. This covert engineering of textual relations not only constitutes an *umwelt* of immediate opportunity for individual innovation. It also leaves a legacy for the *masse parlante*, for the collective. It changes the cultural repertoire; it resets the meaning potential. This is because such *ensemble* effects demonstrate that arrangements across the immense interactivity of textual systems can capture new possibilities of meaning without inventing morphological forms *de novo*. Morphological innovation is risky: it may be misunderstood and/or ignored (consider the fate of Esperanto; or the suggestion of the 'rheomode', the anti-atomistic, 'flow' mode for words, as proposed by the physicist David Bohm (see Bohm, 1980)). As Sapir pointed out, trying to direct the intelligence or designs of speakers involves implausible predictions, despite the logical appearance of systemic change after the fact.

2.2 Background to the problem: 'natural' selection and purpose in semiotic behaviour

Darwin believed that the products of our minds and cultures were evolved 'under natural selection', through the same processes that produced our organic morphologies. The theory of memes is one recent, extreme expression of this sociobiological approach. The approach suggests that changes in a language are not merely analogous with the struggle for survival in a 'natural economy' or 'polity' of alternatives (Darwin's terms), but are part of, or 'homologous' with, those same evolutionary processes. On the one hand, this homology has seemed a vindication for some linguists, neuroscientists, biologists and even speculative philosophers who can generate hypotheticals as to how nature controls nurture (viz. through altruism, deceptions and so on). And certainly, many of the critical issues debated in *On the Origin of Species* apply directly to variation and 'speciation' in language. For example, consider Darwin's concerns around the following topics (analogies with linguistic issues are added in italics):

- Incremental changes (*natura non facit saltum:* 'nature does not make leaps'): viz. *language drift*;
- Migration and migratory barriers: these explain affinities over and beyond the 'minor' effects of areal features: viz. *the dominant effects of language family membership over the direction of change* (see recent findings by Dunn *et al.*, 2011);
- The riches of diversity (the 'profligate' variations of nature) by contrast with modest evidence of absolute innovation: viz. *the ubiquitous character of linguistic variation – every instance of speech is a variant*;

- The problems of seeing / not seeing transitional forms: viz. *language always appears functional 'in situ'*;
- The existence of anomalous morphological traits (vestigial organs) based on the functional forms of known or unknown ancient predecessors: viz. *anomalous forms and asymmetrical patterns in linguistic systems* (see Sapir's, 1921, comments on *who/whom* in English in relation to predicting 'drift'; see e.g. Joseph and Janda, 2003:109, on the explanation of *go/went*);
- The debate as to when variants in 'incipient species' constitute full species: viz. *the similar debates as to the boundaries of a language (e.g. are they territorial or behavioural boundaries?)*;
- The reconstruction of preceding forms through inferences, including Darwin's inference that the origins of humans would be found in Africa: viz. *philological reconstructions and the 'radiation' of language families*;
- The interpretation of hybridity, and also Darwin's many inferences from the human domestication of species: viz. *analogies with human interventions through language policy and laws pertaining to national language; languages in education; official languages and 'working' languages (e.g. in Singapore and East Timor)*.

Furthermore, Darwin used analogy with languages in trying to expound his views of lineage and areal influences on evolution (see, for example, the genealogical comparison in Chapter XIV of *On the Origin of Species* . . . , 1998 [1859]:562–563).

The unconscious performance of individual instances of behaviour; the implicit, latent patterns that realise our systems of meaning; and the little-charted but immense complexity of a language (with its many levels of realisation), all resonate with the view that languages are like 'species of behaviour' – a collectivity, passed on from generation to generation, which sustains itself through myriad, minor variations with adaptive potential. We are all on Saussure's "8.25 train from Paris to Geneva" (Saussure 1959:108). The point is not whether the locomotive and coaches are identical, but whether they contribute a similar '*valeur*' to the relational matrix of specific social strivings. The slight instantial differences of our individual alignments of signs (in their reciprocations of *signifiés–signifiants*) appear to provide the locus for a gradual accommodation of novel experience through unconscious differences in the translation of the code. Profound changes, or accommodations, are (in this view) like a 'glacial creep' – that is, they are beyond the temporal threshold of individuals. We all note a new word here or there and may consciously choose to adopt it; one can quarrel with a pronunciation in 'the young'; but the full cycles of grammaticalisation, or of the sound system, move to a millennial rhythm (Hopper & Traugott, 1993; Joseph & Janda, 2003; Lass, 1997).

On the other hand, the Darwinian context – which provides, as Halliday (2003a:135–136) comments, "the essential interpretive framework for our

endeavours" – creates a contradiction around the exercise of human selection or 'choice'. Darwin named modification "under *natural* selection" specifically "to mark it off" from evidence of *human* selection (Darwin, 1998:88). In this view, humans, like other biological entities, **do not choose** except in a qualified, unconscious way: they only select amongst overt features that "Nature has drawn to their attention". Darwin himself opens up debate with a potential contradiction – his close observations on the selections made by skilled breeders. They 'improve' on nature in the direction they are pursuing . . . but may not be able to explain what balance between many factors in an animal had been the basis of their selections or choices as breeders! Notably then, *On the Origin* . . . sets out from a searching evaluation of human agency in "variation under domestication". In a sub-section that might be invoked in relation to the idea of memes, Darwin considers the role of "methodical and unconscious selection" – two distinct principles that can work in combination. Darwin (1998:41–58) emphasises that breeders **have** been highly successful in modifying their pigeons, dogs and cattle, for example. Yet he claims that this should not be viewed as goal directed (in any teleological idiom): breeders are not "trying to make a fantail", they are just extending something that nature has already selected. One might claim here that this situation is analogous to that of poets who can choose an ensemble of disparate opportunities in a linguistic system in realizing a 'novel' semantic enterprise; yet these same poets may be totally misleading in their explication of the processes of technique by which they made their 'choices' (for a case in point, see T. S. Eliot's claims concerning versification, and as these are investigated in Steele's, 1990, *Missing Measures*).

"Unconscious and methodical selection" (Darwin's subsection) appears to address our own suggestion of 'motivated selection', and, consequently, Darwin appears to be addressing the anomaly raised by Sapir – the 'slope' in linguistic evolution. And it should be noted how Sapir (1949:544) himself wrote so emphatically on the "unconscious patterning" of behaviour in language. Darwin's arguments appear to address too the issues around norm-enforcing habituations in language and culture, for instance, as described in Whorf (1956:151) through "innumerable small momenta". But Darwin's discussion, as lucid as it is, does not, we claim, account for the reflective choices in the cultural traditions passed down as forms of material or symbolic tool: it does not encompass the skills of a college, a profession, a guild, a school of martial arts, a sub-community of craft specialists . . . any network of people who work on, reflect upon, and codify their judgements and behaviours. Each of these progressions into a 'second nature', we refer to here as a *techne*. In echoing the Greek term, a word used by Socrates in his debates with Sophists and rhetoricians (codifiers of skills of speaking: Roochnik, 1996), we can convey more gravitas than the current use of 'technique'. So too, we need to move beyond

the careful reflections of Darwin on unconscious and methodical selection. In Section 2.4, we will see that evidence from biology now demands a reconstrual of Darwin's selection by random mutations alone: random mutations are not the only basis for change in evolution, and may need to be re-examined specifically with respect to reflective, codifying practices in human communities.

In general, linguists have assisted in 'naturalising' language by emphatic statements about the unconscious processes of speech. The implication for language, and possibly for cultural tools overall, was that humans had no significant, enduring control over the direction in which the community practices develop. In this regard, Saussure is said to have taken up Durkheim's description of a 'social fact' – something which one cannot, in reality, contradict in thought or action, though one was never a party to the 'social contract' that the 'fact' presupposes. The latter qualification is essential – early socialization in children becomes their 'nature', and appears to subvert any role for 'choice'. Few linguists working in functional linguistics, pragmatics or social anthropology can doubt the force of ideologically motivated selections and the compulsions of a social pattern (see Hasan, 2009a, on 'semantic variation' in the socialisation of children, and in relation to theories of linguistic variation more globally).

2.3 Contradictory voices in neo-Darwinism

The view of the human species with a future open to the particularities of their context, the specifics of a history, seems in step too with Lewontin's (2000a) emphasis in *The Triple Helix: Gene, Organism and Environment*. The relationship between factors in evolution requires a new mode of thinking – it is not that one aspect of life causes another, linearly, but that the factors are different sides of the one phenomenon. This point Lewontin emphasises elsewhere in relation to the toughest problem of all – products of the mind:

> Mental images, concepts, trial solutions to problems, abstract orderings of the world are the proximate result of physiological processes that go on inside particular human beings. At the same time, of course, the social and natural world in which those beings are embedded are conditioned by and condition those individual thoughts. The formation of an idea is the individual transformation of a social condition by a material organism that is itself the product of individual and social conditions. The material basis of that transformation is the most difficult and most seductive problem in biology. (Lewontin, 2000b:92–93)

This conundrum leads Lewontin to a complex problem recognisable in semiotics: it is another version of the paradoxical 'reciprocal delimitation' between the *signifié* and *signifiant* that was urged by Saussure. The point here is that the two sides of the sign should not be thought of other than as a mutually defining unity; yet its evolved unity has dimensions on different levels of abstraction.

Linguists know this problem through the concepts of 'strata' and of 'realisation' (as taken up by Hjelmslev, 1953). Semiotic systems are radical cases of co-evolution: it is misleading to discuss changes at one level of language in isolation from their realisations on other levels, or as unperturbed by other exponents on the same level. Yet the linearity of explanations in science has made the description of such complex 'history' a very paradoxical undertaking. One consequence of the difficulty of describing the realisational relationship is that the limits of atomism and reductionism are quickly apparent in the study of linguistic systems (for an argument based on Halliday's, 1992b, analysis of the syllable in Mandarin, and on Firth's concepts of 'prosody', and on Whitehead's notion of process, see Butt, 2008a).

Lewontin's work on variation and diversity in biology demonstrates another version of the same dramatic limit. Neuroscientists and psychiatrists, interpreting levels of organisation in the human brain (both through brain imaging and psychotherapy), have highlighted to us similar junctures in their theories (Meares, 2005; Arbib, 2003). Lewontin (2000b) actually hits on the problem of a realisational system, as discussed and developed in SFL from the 1980s, in particular by Lemke (1995), Halliday and Matthiessen (1999), Martin (1992) and Butt (2008b):

> The only coherent materialist position seems to be that the mental and the neural are simply two aspects of the same material physical state. Mind neither causes a physical state of the brain nor is caused by it, since cause and effect do not apply to two aspects of the same state. This view conceives the program of neural research to be one of establishing the mapping of physical and mental onto each other. (Lewontin, 2000b:95)

But this quote needs to be read in relation to a fuller review of **realisational systems** and their role 'as' culture, not 'in' culture. Such systems are the patterns by which human communities maintain their robustness, and by which an efficacy of co-ordinated behaviour supervenes the potential disorder ('entropy') of individuated competition. Such systems are informational and intellectual – they involve different varieties of decision-making by humans, from interventions through explicit 'policy' and legal strictures to unconscious 'contracts' of social facts and ideologies. As suggested above, in the performance of many complex actions, including speech, dance, combat, paddling, swimming and music, humans take on a repertoire, an ensemble of actions which is best described as a 'second nature': namely, humans need to be made over in order to 'embody' the tradition. It is not sufficient to the complexities and characteristics of this process (of taking on a second nature) to categorise it as utterly unconscious, and hence, for theoretical purposes, merely an extension of breathing, digesting and so on. While the experience of natural-ness of our semantic selves in our social environments is to be taken very seriously as a topic of investigation, the fact that meaning is a natural way of starting nature over again is even more challenging to human understanding.

2.4 'Choice' and 'innovation' in twenty-first-century biology

The accumulation of empirical evidence from biology over the last fifty years appears unequivocal. Among specialists in genetics and the biology and chemistry of living systems, there is a widespread rejection of 'random mutations in DNA' as a 'total' account of change and innovation in evolution. The cornerstone of neo-Darwinism does not support the weight of all the scientific activity. Since Crick's "Central Dogma of Molecular Biology" in 1958, experimental findings have come to suggest that the "gene", without any "rigorous or consistent definition" (Shapiro, 2011:29–30), will come to have a "more modest role" in the science of evolutionary change – the current riposte to Crick's linear dogmas being "Genes + 0 = 0" (see Shapiro, 2011).

It is remarkable how society, and sciences more generally, are yet to accommodate the fifty years of findings. Again we need to appreciate the deep social influence of the 'ideology' of genetic determinism – it suits the linear simplicity of explanation that is required by a tabloid; it seems technical and deterministic – a populist view of criteria in science. By contrast with the gene mechanisms earlier in the last century, we are now confronted by 'symbiotic mutualism' and co-operation rather than just competition; systemic, complex interactions; information; cellular self-regulation and 'natural genetic engineering' (which works with horizontal transfers of DNA, not just through vertical descent!). Shapiro uses the analogy of a 'Read Only' mechanism now being viewed as a 'Read−Write' system – the genome is modified by information from many sources; and the creativity of the process is intensified by the experience of stress (catastrophes). In all this observed potential in living cells, the notion of 'choice' and choosing, sometimes by combining functional 'cassettes', is at the core of the cell's ability to restructure its own genome. The implications of the experimental evidence run counter to the core of the way Darwinism has been articulated – for example: (i) in relation to the vertical only 'tree of life'; and (ii) with respect to the idea that nature does not make 'leaps' (see the summary in Shapiro, 2011:129ff.)

This growing archive of empirical evidence concerning 'choice', decision points and innovation through the sharing of DNA is also illustrated by the wider vision of the kingdoms of living organisms put forward by Margulis and other biologists. Similarly pan-experientialists from a number of disciplines have challenged the sciences to reconcile theory with the more recent evidence (e.g. Hoffmeyer, 2010a; Deacon, 2010; and others in Davies & Gregersen, 2010).

In the vision emphasised and argued by Margulis (1998), the first kingdom of the living (bacteria) is seen as the origin of the other four kingdoms through a continuing process of symbiogenesis. This now standard approach to the evolution of eukaryotic (complex) cells is one in which the microbes perform a variety of decision-like operations – distinctive motility according

to exploratory or predatory strategies; 'quorum sensing' (knowing when there are enough of your own 'community' for taking strategic action); recognition of self vs. others; and various forms of differentiating communication: often referred to through metaphors of 'talk' between bacteria, with differentiations between chemical languages which are specific to various species, and those that function like 'bacterial Esperanto' or a 'trade language' across sub-species (see dramatic overview by Bonnie Bassler, 2009, on TEDS and other online sources, viz. open-access Princeton Lectures). This intense community interaction provides the basis of 'symbiogenesis' – new adaptive life forms are created by distinct forms fusing (ingesting but not digesting) to produce a better functional ensemble, a living assemblage with innovative potential.

> The book of life is written in neither mathematics nor English: it is written in the language of carbon chemistry. 'Speaking' the language of chemistry, the bacteria diversified and talked to each other on a global scale. Those that swam attached to those that degraded glucose, the sugar, and so generated power for swimming. The swimming, glucose-degrading partnership led to protists. The rest is history . . . (Margulis, 1998:108–109)

Each human, therefore, is a continuing locus of such attachments, with bacteria greatly outnumbering our own cells, and with our internal environment continuing the characteristics of the earliest environments of microbes. We embody and extend the living 'decisions' taken on the microbial scale in the history of the conditions on earth, just as we carry out and extend the robust semiotic ensembles of cultures now in our own contexts for living.

All is "Selection under Nature" (Darwin, 1998); but all levels involve 'choices' and/or 'decision' points. The analogies with linguistics, explicit in Jakobson's (1973:44–62) thinking in an earlier era of linguistics and biology, are even more emphatic in the current information systems perspective on cells and bacteria. The "proof reading", "redundancy" and "amplification" of information are all part of the potential to create, for instance among the ciliates, a "biologically functional, rapid, and massive genome restructuring . . . in a matter of hours" (Shapiro, 2011: Chapter 3). Of special note is an analogy between semantic domains (the linguistic notion of register) and proteins that share 'domains' (not fixed structures). It is as if a domain is held only as a potential amongst the collective, and that possible forms of proteins are only 'instantiated' as structures under the pressures of particular conditions.

The force of these developments around 'choice' 'at all levels' in biology can point us back to the observation of Sapir concerning linguistic 'drift'. Sapir saw an anomaly in the degree of order in the direction of change in languages through time: in the terms of contemporary sciences, we might have expected greater 'decoherence' as random changes are usually associated with the degrading of a system. There is some value, then, even in the sentimental term: "genius" of the language. We will return below to the chance that Sapir's concern at an 'anomaly' in linguistic drift is actually his prescience in discerning

an analogy, or homology, between the systemic products of human minds and the systemic properties of the biological systems that made such products possible. This is to say that language might provide an exosomatic analogue of systemic operations which characterise a large set of 'realisational' systems, embodied and cultural. Such 'realisational' relationships had to await the tools of microscopy and molecular biology before they could be 'envisaged' in terms plausible to, and therefore legitimated by, natural scientists in biology.

While reviewing the opportunities for cross-disciplinary exchanges in systemic thinking, Shapiro does mention linguistics; but he notes that the subject (in his American context, we assume) might ultimately come to moderate its genetic determinism.

Let us cite one case from linguistics, by way of brief exemplum, that appears to be very close to the 'symbiotic mutuality' and 'horizontal DNA swapping' central to current biological approaches to change and innovation. Mithun (2004:552ff.) reviews functional perspectives involved in 'syntactic change'. Her focus comes to settle on contextual factors that have stimulated the relatively recent developments of explicit signals of clausal relations and conjunction in languages of North America (Iroquoian; Aleut), and in Meso-America and South America (e.g. Guarani and Quecha: p. 570). Her point is that the pressure of literatures and writing from the languages of Europe – those of colonisation – appear to have brought about a dramatically rapid takeover of the potential of the intruding systems of communication. The face-to-face techniques (e.g. through intonation: p. 571) were not viable for signalling appositions and additions and other conjunctive relations in the shift of channel (to graphic) and of medium (to written). A number of language systems of the Americas rapidly took on, then, the structural potential of another lineage of languages.

What ought to be noted in the linguistic cases which, like biological restructurings, are 'happening all about us', is the semiotic logicality, the plausibility and apparent completeness of Mithun's functional account (i.e. from the 'communicative context'). As Shapiro points out, in mentioning the re-inclusion of teleological principles into biology, none of the mechanisms or processes of change falls outside the "currently defined boundaries of biology" and "experimental test" (2011:137). The rapid changes cited by Mithun are, though, the selections of persons acting intelligently. Shapiro and Margulis both use, and defend, the terms 'cognition' and 'consciousness' in characterising the spectrum of decisions and behaviours that cells express (Shapiro, 2011; Margulis, 2001).

Of the many linguists who have written with tenacious scholarship and good sense on these matters around language evolution, Mufwene (2001) has certainly produced valuable accounts of language change using Creole studies as the test case of linguistic plausibility. His approach is also informed by

a careful evaluation of metaphors and analogies from biological sciences – including the examination of the terms 'species', 'organism', 'gene', 'ecology', 'feature pool', 'feature transmission' and 'random changes' (see, in particular, 2001: Chapters 1 and 6).

Mufwene first 'naturalises' the processes by which change is described in relation to Creoles: he argues that Creoles exemplify the wider, typical processes by which change takes place; and that time and rate of change do not necessarily make Creoles distinctive. He sees the transformation of Vulgar Latin into the Romance languages as an instance of creolisation. He brings out the significance of 'species' and the limitations of 'gene' and 'organism' (along with advice from the geneticist Lewontin). He draws on the difference between animal and bacteria in relation to 'feature transmission' to bring out an analogy with the situation of language evolution: namely, that language will have its own distinctive principles of transmission.

In our view, this turn of argument misses the opportunity for a necessary reinterpretation of 'choice' in nature, and therefore in language. In fact, Mufwene places the issue 'out of court' by emphasising the undirected and unconscious bases of linguistic variation (2001:147; although the wording is carefully expressed to include adaptations according to communicative needs). Our view is that the straightforward acceptance of this conventional position, along with his assumption that change is, first of all, an I-language or idiolectal phenomenon (see 2001: Chapter 1:2), constitute a problem. Together these restore a view of genetic lineage and individualism in language which occludes the challenge presented by semiotic products of the collective mind (although the emphasis on 'species' as an analogy appears to balance the debate).

Considering interdisciplinary work with a wider lens, various scholars have been led to the conclusion that the process character of reality is never without some degree of mindfulness, perhaps better described as a capacity to accumulate experience and to take direction from that 'history'. The spectrum of such views (following the process philosophy of A. N. Whitehead, 1864–1947 (1920)), is wide, and includes many celebrated figures, e.g. C. H. Waddington (1977) and Charles Birch (1999) among a number of biologists, philosophers and theologians. Consequences of this position are, briefly, that there is not a need to develop an account of mind and then consciousness '*de novo*' (everything has some potential for experience); and that the weight of findings about bacteria and supposedly 'simple creatures' tends to support rather than diminish such claims.

Even physics has added new ideas about biological openness and how we understand 'choice' in an increasingly open universe, a universe that encompasses 'downward causation' or, at the least, increasing challenges to atomism and reductionism as they apply to both physics and biology. Experimentation now has brought quantum effects up in scale from atoms to include

biological molecules. A crucial observation in this changing demarcation line is that the literature of quantum mechanics has always "grossly overestimated" the "decoherence" that was involved. "Over the last 300 years, the crude reductionist hypothesis has been that big things are made of little things. This could be wrong, and new laws of physics may be needed . . . not just of emergence" (Nobel Laureate, A. J. Leggett, Address at Macquarie University 2010; see also Leggett, 2008).

2.5 The renewal of nature through semiotic experience: the teleological illusion

Socio-semiotic systems change utterly the resources humans have for accumulating experience. This is, as emphasised above, not just a quantitative expansion – the semantic evolution of a speech fellowship (and then of 'persons', to follow Firth's strictures) results in new modes of experiencing, or new opportunities to engage with (or shrink from) experience. The potential to interact with another at a distance becomes subtle and qualitatively different, particularly through the means of 'topicalization' over a 'third' participant (Trevarthen's "secondary intersubjectivity" in the child; see e.g. Trevarthen & Hubley, 1978). This leads on to the development of a 'toolbox' of practices for talk at a distance, or at various removes in abstraction – viz. the textual metafunction in the Hallidayan model (those resources for sustaining texture, and those that most distinguish human from non-human semiotic systems). The resources for expressing the future and for using conditionals will change the balance between the actual and the possible in talk, with likely consequences for how communication can be decontextualised and repackaged for different situations (e.g. the way we construe simulacra of experience in schooling or 'simulation' training). Our resources for drawing analogies, along with the heuristics of conjecture (as above), can create a 'chreod' (or 'canal') in discourse by which topics can flow dramatically towards greater elaboration, discrimination and abstraction (the kind of qualitative revolution in discourse that Halliday has illustrated in the evolution of scientific discourse in English – the drift towards 'Things and Relations', Halliday, 2004 – and in the work of Kappagoda (this volume) on ancient Greek and semiosis in science).

As compelling as the social and semiotic orders are, for a number of reasons they can be viewed as some kind of development of the biological and material orders of the natural world (of which they are still a part): they may be distinct in the way information is created; they appear to offer new decisions over the timing and distribution of information; and they may be distinct in the opportunities they provide for actively probing experience through the heuristic potential of meaning – through hypotheses, play and the method of "as if / what if . . . " of natural conversation (viz. Vaihinger, 1924). In the heuristics and

model building of linguistic combinations, humans can open up experience to a semiotic freedom (Hoffmeyer, 2010a, 2010b) and achieve knowledge by means that need not cost an individual its life, or wellbeing.

2.6 Motivated selection and choice: bridging the lacunae in our depiction of experience

Our answer to the dilemma set out in this chapter involves a particular construal, and extension, of ideas that, as far as we can ascertain, derive from Jakobson and Tynjanov – from their metaphor of the text as a 'system', their rejections of mechanism, and of organism as satisfactory metaphors for linguistic organisation. Tynjanov, in fact, appears to have been the first in suggesting a 'systemo-functional' approach to language (Steiner, 1984:99ff.).

The strength of their systemo-functionalism lies in its potential to deal practically and theoretically with the changing '*valeurs*' of human semantic behaviour – from the levels of content, which are often conceivable as choices, to the intricacies of expression, which typically involve such deeply latent, embodied discriminations of behavioural repertoires that they rarely receive satisfactory depiction in atomistic theories (viz. in phonemic analysis).

Motivated selections are those regularities that could not be rationally explained away as random, and whose effects in a semantic ensemble appear to constitute a convergence of diverse resources towards some recognisable end. Taken level by level, motivated selections are manifested as a 'drift' – a semantic drift; a tendentiousness of realisations which create a current in the texture as palpable as the current felt when stepping into the ocean, or into even an apparently quiet river. The texture does not always declare overtly its formal consistencies. They may have to be determined, methodically, even when there may be a strong consensus about the semantic consequences of what has been formed in language. Our capacity to interpret the 'semantic pressures' which bear upon us are far in advance of our techniques for reporting on the grammatical/textual correlates of such interpretations.

As we build up an account of the cross-systemic ensemble of 'selections' which give the tendentious, teleological character to a text under question, it is reasonable to claim that what we are doing is elucidating **the choices that the text 'recruits' to its purpose**. This is a figure of speech: a way of depicting the ensemble effects that can emerge from linguistic analysis. When we use 'choice', it needs to keep company with the details from which one can choose. The chooser is not exercising freedom in the sense of obvious, formal innovation. But, across a myriad small calibrations, one can argue for semantic congruence between systems with unlike realisations that create, nevertheless, a co-ordination of choices directed to a semantic purpose. It is in this fine stitching of the socio-semantic fabric that we display our purposes and

exhibit our innovations and social uniqueness (our style of differences in being fundamentally similar). Given the restrictions of one chapter in a volume, we will need to direct the reader to cases of analysis (e.g. in Birch & O'Toole, 1988) which exemplify the "patterning of patterns" (Hasan, 1985b) which are the discourse correlate of motivated selection.

More broadly, the 2,500 years of rhetorical study in Europe supports the notion that speaking involved techniques which could be variously studied and mastered; in short, there was a '*techne*'. Consider here the Roman orator Cicero and his training in Greek rhetoric (Wardman, 1976). We all can attest to certain facts of discourse, namely: that, whether as joke telling, or lecturing, or moving another person to action, speech can be organised for better or worse, and that its efficacy can be improved upon through reflection and the study of the choices made in exemplary instances. This is what Aristotle appears to have sought in his works on rhetoric, logic and drama: a 'systematics' and practical guide to the products of mind, thereby extending his general 'biological' methods of enquiry.

If we consider, for example, an aspect of linguistic organisation not often featured for its semantic consequences – clausal taxis – the spectrum of issues surrounding motivated selection can be glimpsed. Some extracts from a speech we know a good deal about today will best serve: President Lyndon Johnson speaking at Johns Hopkins University in 1965 – the crucial apologia for escalating the US troop numbers in Vietnam. The speech was made before parents and graduating students whose families may come to be in 'the firing line'.

1 || Tonight | I | want to review | once again | with *my* own people | the views of *your* Government ||

Theme	Subject Senser

2 Tonight | Americans and Asians | are dying | for a world [[where

Subject Actor/Medium middle voice (undergoing)	*for a* – collocation of *cause*

each people | may choose | its own path | [[to change]]]]

non-specific		*path* – metaphoric	ambivalent

A 'simple' strategy that we see exemplified here is the use of syntactic parallelism for situations which the speaker wants the audience to see as parallel in meaning or value. The choices involved are typically 'paratactic', to lay out the equivalence most forcefully. This is a standard rhetorical 'trope' and 'schema', that is to say it is both a 'swerve' in the meaning ('parison') and a

strategy of the syntax (note: rhetoric did observe distinctions of stratification, as well as of metafunction, viz. '*ethos*', '*pathos*' and '*logos*'). Few with the chance to reflect on the speech, for instance in the process of crafting it, could be unconscious of the choices being made:

3	|| This	is	the principle [[for which our ancestors fought in the valleys of Pennsylvania]]
	Theme Subject Token		Value

4	It	is	the principle [[for which our sons fight in the jungles of Vietnam]]
	Theme Subject Token		Value

What is not so codified in rhetoric, and in our conscious repertoire, is the grammatical corollary: namely, the choice to create a 'hypotactic' sleight of hand when asking an audience to accept what you know to be dubious or patently false. The move in this case is to create crucial transitions in the argument by means of concentrated complexity, virtually a slide of subordinating and embedded structures (hence "emplexity"; Tuckwell, 1999). If the lexis is kept "in the plain style", a counterpoint is created whereby the claims continue to appear straightforward (i.e. lexically), while the grammar is actually working covertly to obscure an argument that needs more scrutiny. Consider the following lines from Johnson's speech (clauses 13–15.1, and further below (17–25.1.1), in which semantic vertigo is likely to obscure the implausibility of the claims being made:

[13]We fight || [14]because we must fight ||
[15]if we are to live in a world [[[15.1]where every country can shape its own destiny]]

Taxis:	α	x	βα	x	ββ	[[]]
	13		14		15	15.1

[16]And only in such a world will our own freedom be finally secure.

This is not to say that bald-faced lies will not be pronounced in clause simplexes, often as part of this semantic rhythm between higher and lower forms of interpretive load:

[5]Vietnam is far from this quiet campus ||
[6]We have no territory there, || [7]nor do we seek any. ||
[8]The war is dirty and brutal and difficult. ||

[9]And some 400 young men << [10][[10.1]] >> have ended their lives on Vietnam's steaming soil ||
[10]born into an America [[[10.1]bursting with opportunity and promise*.]] ||

The motif of 'choice' is raised in the use of the marked effective process – "young men . . . have ended their lives" – when one might have expected the middle voice "have died", or external agentive / effective: "have been killed". Johnson's actual words bestow the implication of choice on the part of those men; and this is consonant with the latent semantics of sacrifice (and therefore of noble enterprise).

The principles at stake in declarations of expeditionary wars often require covert strategies; nevertheless, simple untruths and contrivances suffice when cultures and distant locations are so far beyond the experience of an audience to call the speaker to account (see e.g. Young, 1991 for an analysis of Johnson's claims about the Gulf of Tonkin 'Incident' (pp. 117ff.), and of Nixon's claims about the number of supposed deaths in land reforms in Vietnam (pp. 50ff.).

[17]This kind of world will never be built by bombs and bullets. ||
[18]Yet the infirmities of man are such || [19]that force must often precede reason ||
[20]– and the waste of war, ^ E ^ the works of peace ||
[21]We wish || [22]this were not so ||
[23]But we must deal with the world || [24]as it is ||
[25]if it is [[[25.1]ever to be [[[25.1.1]as we wish]]]] ||

In this we experience a 'slide' into hypotaxis, with claims that are extremely dubious in their truth and/or application to the circumstances being discussed.

At another scale of textual subtlety, it seems implausible to overlook the probable motivation in the choice of 'we have a promise to keep' as the answer to 'Why are we in South Vietnam?' The relations between this sententious formulation and the president's design must be viewed not only with Frost's lines,

> The woods are lovely, dark and deep.
> But I have promises to keep.
> And miles to go before I sleep,
> And miles to go before I sleep,

but also with the organising motifs at the outset of the text: the metaphors of choosing a "path" and "taking" a "painful road" (viz. Frost's much anthologized "The Road not Taken"). The ubiquity of memorable fragments from Frost provides, then, part of that redeemable, intertextual canvas against which the figure of the text can be seen, namely, as a mode of symbolic action in a specific socio-historical context (Frost had read his work at the inauguration of President Kennedy, and become akin to a poet laureate to the administration). The affective power of this soft cultural orchestration may be unconscious for

some (even at Johns Hopkins University) and consciously tracked by others, even by those at a semiotic distance (viz. Australians like us). The main point, however, is that it constitutes motivated selection.

We can see that there is a gradation of overtness in these examples: while some can be discussed and consciously applied in the processes of composition, even in the real time of speech, others are better characterised as 'latent organisation in text' (see Kappagoda, this volume). This is particularly the case when we see systems in an efficacious ensemble. Such combinations are the latent patterning in text that allows us to create semantic novelty. The novelty derives from the way a 'weighting' of choices can create a semantic effect that is more than any aggregate of the options in the clause. The ensemble effect is both an extension of the grammar and a rhetorical unit.

The notion of 'choice' in meaning-bearing behaviour is part of a surge of indices that suggest that the sciences, at least the natural and human sciences, have for too long assumed methodologies of rules and constraints. 'Choice' is an index of an openness in living forms, forms that utilise experience. Linguists have a unique role in describing the variation in the products of mind, in the 'species' of semiotic process. 'Choice' moves naturalism and experience back to the centre of our semantic science.

3 Choice and language variation: some theoretical reflections

Maria Freddi

3.1 Halliday on choice in language: from the 1960s papers on grammar to the 1990s quantitative studies

In this first section, the notions of 'language as a networked system of choices', 'probabilistic grammar', 'markedness' and 'register as resetting of the probabilities' are discussed and their interrelations illustrated. It is argued that choice is the key to understanding the relation between the system (the code), the single instantiation (the text) and a set of recurring practices (the register and the corpus), and a way to reconcile distant theories such as structuralism, Chomskyan syntax and a more dynamic view of language as action and creative activity. The distinction between system and use, theory and data is still crucial to twenty-first-century linguistics because large quantities of language data have become available to researchers. At least to some corpus-driven linguistics, the totality of a language is partially observable in large generic corpora (cf. Thompson & Hunston, 2006b). It is therefore interesting to go over the ideas put forward by Halliday in the early papers on grammar in the light of a series of studies published in the 1990s, where he rethinks the relevance of quantitative data to his theory of grammar and of language as social semiotic.

3.1.1 Language as a networked system of choices and probabilistic grammar

Halliday (1977a:32; and also 2005b:63) criticises Chomsky for having unnecessarily polarised the discipline of linguistics, making the two views of language as rule and language as resource incompatible, presented as an opposition between language as system and language as actual behaviour. The dichotomy, which, Halliday says, might also be posited in terms of logic against rhetoric and ethnography, can be superseded if language is seen as a set of meaning choices in context, or a "symbiotic approach to the relations between our activities and language" is taken (Fries & Gregory, 1995:xiii). This implies the tristratal model of language as meaning potential, lexicogrammar and expression, as

embedded in the environment.[1] As Halliday himself states, "it is the uses of language that, over tens of thousands of generations, have shaped the system" (cited in Fries & Gregory, 1995:xii). Dualism and dichotomistic thinking is therefore replaced by a holistic view of language in which choice is the unifying principle between system and instance, as stressed respectively in "There is only one phenomenon here, not two" (2005d:82), and "Language (the linguistic system) differs from parole (the linguistic instance) only in the position taken up by the observer" (2002d:412). This point of view is set out clearly in Halliday and Matthiessen (2004:20), where it is said that the proposed model tries to capture the nature and dynamic of a semiotic system as a whole, entailing a way of thinking that is not compositional: rather, it is "systems thinking". This has been recently reprised by Matthiessen (2009:14), who, in going over the history of Systemic Functional Linguistics (SFL), talks about "a holistic approach towards scientific exploration".

More specifically, Halliday sees choice as characterising the language system as this is conceptualised as a network where each node corresponds to alternatives, e.g. the system of Moods, the system of Nexuses, the system of Voice. As a consequence, grammar is organised into sets of often, though not always, binary oppositions. For example, the oppositions are between positive vs. negative Polarity, active vs. passive Voice, temporal vs. modal Finiteness, Quoting vs. Reporting, simple vs. complex Tense, etc. All these are mutually exclusive choices, therefore they identify as paradigms which, even in common usage, are understood as "a set of substitutional or oppositional relationships between members of the same class" (Merriam-Webster Online Dictionary). Grammar, that is, is modelled paradigmatically with paradigmatic organisation involving contrasts usually within the domain of the clause, and choice understood as "theoretical contrast in a system of options, that is choice equals option" (Matthiessen *et al*., 2010:69).

Although some systems are tripartite (e.g. Tense can be present/past/future), and most allow for further choices to be made (e.g. within indicative, declarative or interrogative, and within interrogative, wh-questions or yes/no questions, and so on), in accordance with what Hallidayans term degrees of 'delicacy', following Halliday (2002a:58; see Butt, 2001:1822; Halliday & Matthiessen, 2004:22; Matthiessen, 2006; Thompson & Hunston, 2006b), they do not throw off the governing principle of basic paradigmatic alternatives reflecting the choices language users make when they speak or write.

[1] For a graphic representation of this model of language, see Halliday and Matthiessen (2004:25). Stratification, i.e. language as a complex semiotic system having various levels or strata, is also sometimes represented as the projection of one stratum onto another (see Derewianka, 2001:257), and my own representation in Freddi (2004; 2006:15), but, for a different graphic, see also Halliday, this volume, Figure 1.1).

In 1969 this is formulated as "The grammar of the clause may be represented as a network of such options, to each of which is attached a realization statement showing the structural 'output' of that option", and "Underlying the structural description of the clause, therefore, is a systemic description in which the clause is represented in terms of the options selected" (Halliday, 1969:82). The two quotes, however, add a further dimension to the model of language as a systems network, namely that of structure, or syntagm, and link it up with the already seen dimension of stratification and the realisation principle. In order to understand what is meant by "realization statement" and "structural 'output'", let us take Mood as an example: whenever indicative declarative (vs. interrogative) is chosen, the option brings about the necessary sequencing of elements that constitute a declarative clause, e.g. Finite preceding Subject followed in turn by lexical verb, Complement, etc., that is to say, "the systemic representation is then realized as structure, with linear ordering" (1969:83).

In this early formulation, the relation between paradigmatic and syntagmatic axis is such that "structural function in the clause is fully *derivable from* systems of options in transitivity, mood and theme" (Halliday, 1969:82; emphasis added) and "the structure of the clause is seen to *be determined by* the selections made by the speaker from among the options available" (1969:87; emphasis added). However, the derivational and deterministic relation holding between system and structure is seen in more probabilistic terms when the argumentation is concerned with the relation between system, corpus and text ("the corpus makes it possible to test the realization statements", 2002d:407).

For speakers to be able to produce and understand new texts there must indeed be a relation with a more abstract level showing systemic stability. Such relation is one of probability, hence the notion of 'probabilistic grammar' (cf. "Once you say: 'choose for polarity: positive or negative?', or 'choose for tense: past or present or future?', then each of these options could have a probability value attached", Halliday 2005a:45) and of frequency in text as "the instantiation of probability in the grammar" (2005b:64; 2005c:133). In (2005c:133), Halliday reiterates that "any concern with grammatical probabilities makes sense only in the context of a paradigmatic model of grammar".

3.1.2 Register as resetting of the probabilities

This probability, however, is conditioned by non-linguistic contextual features in that the set of available options speakers can draw from in producing texts is constrained by the nature of what they want to say/write to whom under which circumstances. The system of available options is inextricably anchored to the co-textual and contextual environments. Context is the motivation for the choice being made by the speaker or writer; it is fully integrated in the grammar. Again, in Fries and Gregory's words, "The very formalization of the functional

grammar, that of the system network, is itself a contextual formalization, part of a theory of language as meaning potential, represented as choices in environments (contexts)" (1995:xii). In other words, grammatical structures are the result of the contextually relevant choices made in the systems (1995:xii).

In this view, choices made by speakers/writers at the level of text reset the probabilities in the grammar to an infinitesimal degree, and only when considering register variation, i.e. systematic variation in probabilities, can the changes in the relative frequency of grammatical systems be observed (cf. Halliday, 2005d:84: "a syndrome of lexicogrammatical probabilities"), or else, when analysing language change over long periods of time, i.e. diachronic changes (cf. 2005d:90). Choice is for Halliday the propeller of variation across all dimensions, e.g. child development, time, style, register, this one perhaps establishing a second-order stability being defined as the redressing of the probabilities in the grammar (see also 2002d:400), which in Halliday's present formulation identifies as a "functionally motivated sub-system within the language" (this volume).

In the 1990s quantitative studies, Halliday says that the theoretical validity of the relative frequency of grammatical structures should not be denied, in as much as the relative frequency of lexical items is thought to throw light on the overall lexicon of a language. By referring to Svartvik's (1966) findings on the proportion of active to passive clauses across a range of registers in English, Halliday argues that such data should lead to generalisations on the grammar of English as a whole, i.e. the system of language as a whole, even though, he notices, probabilities do not have a predictive but an interpretative value. The idea of a paradigmatic grammar with probabilities attached to grammatical systems is then tested on a small sample of data (see also Teich, this volume, on register analysis as "inherently quantitative"). The question is posed in the following terms: Within the system of Voice, what is the proportion of active to passive clauses, and therefore what are the probabilities for either one to occur? Moreover, certain probabilities seem to have a conditioning effect on each other, so that another question that needs data investigation is "was the probability of a choice (in one system) affected by a choice in another?" (Halliday, 2005c:132), as in: What is the effect on the probability of declarative vs. interrogative Mood of choosing either active or passive in the same clause? The two questions are addressed by Halliday under 'markedness' and 'conditional probability'.

3.1.3 Markedness

'Markedness' is another central concept of probabilistic grammar. Results from his frequency counts lead Halliday to hypothesise that grammatical systems are of two kinds, the equiprobable, i.e. those whose terms show a 50 per cent chance of occurring, and the skew, in which the terms display a 9:1 ratio, as with the

active:passive. Along these lines, Halliday interprets skewness as markedness: the most chosen term of the system is the 'unmarked' term representing the 'default' condition, that which is selected "unless there is good reason for selecting some other term", while, from the point of view of frequency, the equiprobable systems have no unmarked term (Halliday, 2005b:68; see also, with reference to his teaching Chinese, "I didn't know the term unmarked at that time, but what I was looking for was some guidance about which, if any, was the unmarked term"; 2005c:131, 138).

Frequency, therefore, underlies the concept of markedness: the unmarked term is the most probable one in a system whose probabilities are skew and corresponds to the option that is found to occur most of the time in a corpus (e.g. active compared to passive). Any systematic deviation from that default condition represents a resetting of the probabilities that define specialised registers (e.g. passives tend to abound in scientific prose, the future tense becomes the unmarked option in weather forecasts; see also Halliday, this volume). However, Halliday adds the caveat that the unmarked term "is not defined by frequency" (2005b:68), stressing once more that the unmarked choice is just the manifestation of large-scale probabilities (cf. Section 3.1.1).

From the point of view of markedness, register-specific variation, or, in his wording, "the extent to which local probabilities depart from the global patterns of the language as a whole" (Halliday, 2002d:400), can be referred to as "reversal of marking, whereby a term that is less frequent in other types of discourse becomes significantly more frequent in one particular register" (Halliday, this volume). What remains to be checked is the investigation of the distribution of several grammatical systems on the basis of the many currently available corpora. This leads us onto the next issue, of 'conditional probabilities'.

3.1.4 Conditional probabilities

What can be further observed in a corpus is the conditional probability of two systems co-occurring (or 'intersecting' to use Halliday's terminology, which, as we will see, is taken up by Matthiessen). For example, if we take two apparently independent systems, Voice and Polarity, not only can we look for the unmarked term in each of the systems, if there is one, but we can also ask whether there is a conditional effect of Polarity (B) on the probability of finding active vs. passive (A), and, vice versa, P(A|B) and P(B|A). A series of tables adapted from Halliday (2005b; 2005d) are given (Tables 3.1–3.7), showing some possible combinations with the frequency values specified (the values are hypothetical). The tables help us to see the concept of markedness operationally and also to see how it differs from conditional probability (which is investigated by Matthiessen, as discussed in Section 3.2, and taken up by Tucker to model formulaic language, see Section 3.3).

Table 3.1. *Equiprobable systems*

Voice \ Polarity	+	−	Total
Active	100	100	200
Passive	100	100	200
Total	200	200	400

Table 3.2. *Skew systems*

Voice \ Polarity	+	−	Total
Active	324	36	360
Passive	36	4	40
Total	360	40	400

Table 3.3. *Mixed systems*

Voice \ Polarity	+	−	Total
Active	180	180	360
Passive	20	20	40
Total	200	200	400

In Table 3.1 both systems (Polarity and Voice) have no unmarked term, they are both equiprobable, while in Table 3.2 both systems have one term unmarked (both are skewed 9:1).

In Table 3.3 the system of Polarity has no unmarked term (i.e. it is equiprobable) while the system of Voice has one term unmarked (i.e. it is skewed 9:1). By paraphrasing, there is an equal chance of encountering positive or negative clauses in a corpus, but in each case they are more likely to be active rather than passive.

In the scenarios so far, the two systems, though occurring simultaneously, are fully independent, that is, no conditioning effect is at work. In the following situations, according to Halliday's analysis, what is observable is not just markedness, but more accurately conditional probability, which he terms 'favoured associations' (Halliday, 2005a; 2005b; 2005c; 2005d).

Table 3.4 shows some of these favoured associations (see the figures in bold). Both systems have no unmarked term, but active with positive are favoured and so are negative with passive, because the figures are higher than those for the other two combinations (namely active and negative, and passive and positive).

Table 3.4. *Favoured combinations*

Voice \ Polarity	+	−	Total
Active	**140**	60	200
Passive	60	**140**	200
Total	200	200	400

Table 3.5. *One favoured combination only*

Voice \ Polarity	+	−	Total
Active	**140**	100	240
Passive	60	100	160
Total	200	200	400

Table 3.6. *One favoured combination only with reversal*

Voice \ Polarity	+	−	Total
Active	**140**	60	200
Passive	100	100	200
Total	240	160	400

In Table 3.5 both systems have no unmarked term, but there is an association between active and positive, and positive Polarity (B) tends to favour active Voice (A) because 140/200 > 140/240, i.e. the ratio of actives over the totality of positive Polarity clauses is larger than the ratio of positives over the totality of active Voice clauses. In other words, B acts as a conditioning environment on A (Halliday 2005a:57) and P(A|B) > 0.

In Table 3.6 both systems have no unmarked term, but here active (A) favours positive Polarity (B), because, compared to Table 3.5, 140/240 < 140/200, that is, A acts as a conditioning environment on B and P(B|A) > 0.

Finally, an example of the situation presented in Table 3.7 can be found when looking at the co-occurrence of the type of Interdependency (Taxis) and type of Projection (note that D stands for 'direct' and I for 'indirect').

Table 3.7 shows how both systems have one term unmarked, but there is a strong association (conditioning), even stronger than in Table 3.4, between Direct Speech and Indirect Thought, and the association is such that the reverse combinations appear as marked options (i.e. Indirect Speech and Direct

Table 3.7. *Favoured combinations with reciprocity*

Projection \ Interdependency	+	–	Total
Speech	**180**	20	200
Thought	20	**180**	200
Total	200	200	400

Thought). In formal terms, the reciprocity in the associations can be represented as follows: P (speech|direct) = P (thought|indirect).

According to Halliday, these thought experiments have implications for an understanding of how the language system works and for theorising on language change over time. The grammar of a language can in fact be represented paradigmatically as a network of choices, while the mutual conditioning of these choices and the subsequent altering of the probabilities, which might be brought about by register-specific variation and language contact, can be seen to affect diachronic variation.

3.1.5 System, register and instance

The quantitative validation of the resetting of the probabilities in the grammar is part of the legacy bestowed by Halliday on studies which follow closely and attempt to move up from the single instantiation of the text to registers and, sometimes, genres of communication as sampled in corpora (e.g. Ventola, 1995).

A more ambitious task is taken on by Matthiessen, who aims at providing a description not only of register variation, but also of the system as a whole, based on a large-scale quantitative analysis. This is discussed in Section 3.2.

3.2 From frequency to probability: Matthiessen's report

In order to deal with the question of what relation there is between the linguistic system and the instance (whether single text or corpus) and how we move from observed frequencies to systemic probabilities, Matthiessen (2006) takes up Halliday's suggestion that the model should be tested on large samples of language data, in accordance with the statement that "it requires a lot of observations to approximate to a quantitative profile of the grammar of a language" (Halliday, 2005a:59). The assumption is the same as in Halliday (2005d), namely that the relationship between text, considered either as a

single example or as a collection thereof (i.e. corpus), and the system is one of 'instantiation', where the corpus occupies the instance pole of the cline.

3.2.1 Instantiation

If instantiation, or the symmetrical term 'systemicisation', is to be seen as a cline from actual texts to the overall potential of language (see also the terms 'logogenesis' and 'phylogenesis' as employed in Matthiessen, 1995), from an analytical standpoint, it could be glossed as actualisation, exemplification and even manifestation (incarnation is perhaps more apt to describe other realms). An intermediate degree of instantiation is represented by registers, that is, "averages of relative frequencies" (2006:105).[2] Once more, the key to conceptualising this relationship between actual and potential seems to lie in the difference between frequency, which is experimental, as derived from observations, and probability, which is theoretical and cannot be observed.

Matthiessen's empirical study consists in the semi-manual analysis of frequency distributions of the key systems of the lexicogrammar of English, aimed at establishing probability profiles. The study takes two directions. First, he checks whether the frequency distributions change when moving from single text (a spoken interview) to a set of texts (a collection of spoken interviews). As a further step, distributions across media, but independent of text type, are compared (i.e. spoken texts in general), to then look at both media taken together (both spoken and written texts). The linguist's analytical movement reflects the cline of instantiation from text through register to corpus, assuming that the corpus is closer to the system than the individual text is. The variations in the distributions are recorded and a bottom-up approach is proposed to match the top-down approach usually taken by systemicists. Finally, he investigates the distribution of binary intersections (combinations or co-occurrences), either within a given grammatical system or between systems in a corpus of texts.

3.2.2 Probability profiles

Matthiessen's analysis is based on a sample of 6,500 clauses for systems of the clause and 6,500 clause complexes (about 16,000 clauses), which indeed is a large sample and therefore likely to get us close to the system. The ultimate aim is to draw the probability profiles of the different grammatical systems of English and to check for any conditioning effect. The author counts the relative frequencies of different grammatical systems and of choices within them (i.e. of 'terms in a given system'), both taken in isolation and considered when

[2] Matthiessen has recently rephrased registers as "aggregates of languages evolving in a short-time frame" (cf. the interactive session of the 2010 ISFLA conference, Vancouver).

co-occurring with other systems, the latter being referred to by Matthiessen (2006:104, 114) as 'intersections' of systems, again using Halliday's phrasing (cf. 2005b; 2005c; 2005d). Each clause system analysed consists of two or more terms. Each term is counted and the relative frequency reported (Matthiessen, 2006:106). Each of the counts is interpreted as the distribution of the choices made by the speakers and writers in the corpus in relation to a given resource in the grammar of English. This is then treated as its probability of occurrence on the systemic level. Questions such as 'Is the probability of occurrence of the active vs. passive Voice skewed when conditioned by Polarity?' can then be answered and patterns of favoured and disfavoured combinations can be incorporated into the description of the system.

For example, if we take the system of Taxis, i.e. parataxis and hypotaxis, counts show that the former is selected (i.e. occurs) 49 per cent of the time, with the latter at 51 per cent, hinting at an equiprobable system. However, since systems are "paradigmatically simultaneous with one or more other systems" (Matthiessen, 2006:113), it is more interesting to count, for example, all instances of parataxis vs. hypotaxis per Logico-semantic type (i.e. idea, locution, elaboration, extension and enhancement). By doing so, one finds out that the probability of finding either one is not the same, but varies depending on the kind of Logico-semantic relation holding between clauses. Certain combinations are equiprobable while most are skew. In particular, while locutions and extensions are found to occur roughly 50 per cent of the time in combination with parataxis and the other 50 per cent with hypotaxis, ideas are almost always hypotactically projected, while extensions are almost always paratactic (2006:116).

Another question Matthiessen explores is whether the intersection (co-occurrence) of systems from different metafunctions, we will call them 'between systems' intersections, e.g. Mood types and Process types, is the same as with systems from within the same metafunction, i.e. 'within system' intersections (e.g. Mood type and Polarity). Within the system of Transitivity, for example, he observes the frequency with which Process types co-occur with various Circumstantial Adjuncts (2006:122–126). Or, within the system of Moods, the frequency with which different Subject pronouns co-occur with different Mood types (2006:132–133). The same kind of co-occurrence he observes across systems. For instance, he counts the association between Process type and Polarity (2006:126–128) and Process type and Mood type (2006:128–130).

Matthiessen concludes that there is a difference in the frequency distributions between what happens with 'within system' combinations and 'between systems' combinations, observing that while with the former the selections are different depending on the terms of each system (e.g. different Process types select different Circumstances with variable frequencies), with the latter the

frequency distributions of the terms of the various systems analysed are a lot less variable, e.g. Mood types preferences expressed in frequency order are the same for all Process types (2006:134).

This reflects the fact that while 'between systems' intersections, e.g. Interdependency and Logico-semantic relations, however simultaneous, clearly represent combinations of separate paradigms, 'within system' intersections (e.g. a given Process type with a given Circumstantial Adjunct), on the other hand, are more evidently co-occurrences along the syntagmatic axis and partly dependent on the structural realisation rules of the lexicogrammar. To exemplify, the co-occurrence of certain Circumstances with a given Process is somewhat constrained by the configuration of Transitivity: Matter is found to occur frequently with Mental and Verbal processes, but never with Existential. The kind of conditioning operating here is therefore different and more semantic in nature. This is a possible explanation for the variability in the frequencies. In conclusion, Matthiessen's analysis moves from drawing the probability profile of paradigmatic choice and ends up in syntagmatic structural choice; cf. "the cline of instantiation is thus related to the axial modes of organization – the systemic axis and the structural axis" (2006:135).

3.2.3 A discussion of Matthiessen's findings

Compared to Halliday's counts and analyses (see Halliday & James, 2005:96: "figures he had arrived at in the 1960s by counting manually 2,000 instances each of a number of sets of systemic options"[3]), Matthiessen's analysis has the advantage of being based on a larger sample of instances (6,500 clauses and 6,500 clause nexuses involving a little over 16,000 clauses extracted from about 1.5 million words of text). In this regard, it could be argued that his results not only reinforce Halliday's findings, but also get closer to being an approximation of the system. However, as Matthiessen himself notes, they are far from being automated analyses of large-scale corpora. It is, in fact, through a large reference corpus that, because of its size and balance, we can infer patterns located higher up along the cline of instantiation. Indeed, a balanced representative corpus tends to "the pole that defines the total potential of a language, i.e., language as system" (2006:108). The issue of corpus size is considered by both Halliday and Matthiessen as decisive in the relation established between instantiation and the language system, with both subsequently stating that if the sample is large enough it can support descriptions of the system: "Given large enough samples of text, text analysis thus allows us to move up the cline of instantiation

[3] Note, incidentally, that Matthiessen's counts are also larger than those by Nesbitt and Plum done over 2,733 clause nexuses from a corpus of 100,000 words (cf. Halliday, 2005c:131).

from instance towards potential. How far up we are able to move really depends on how large a sample the analysis can cope with" (Matthiessen, 2009:52).

Corpus composition and balance, i.e. the range and proportions of registerial variation covered, however, is of no less importance when aiming at a full description of the language system. Matthiessen's analyses are based on a possibly opportunistic text archive rather than a corpus, consisting of more spoken than written texts (Matthiessen, 2006:113). In other words, the nature of the data ought to be taken into account and details about the texts sampled in a corpus should be made available to other researchers, so as not to falsify any inference which might be drawn regarding the system.

On the other hand, Halliday's model, while maintaining polarisation between the individual text and the system, with register as an intermediate degree between the two, is corroborated by being extended to more combinations of grammatical systems. The idea of conditional probability applied to grammatical choices, that is, how given grammatical systems combine with other systems by conditioning each other, is proven valid on a much larger set of combinations (the various intersections analysed). The frequencies in the tables provided by Matthiessen (2006) (which can be seen as contingency tables presenting the relationship between two categorical variables) tend to become probabilities because they are derived from observations of a wide range of systems. From a methodological point of view, the outcome of Matthiessen's analysis is a better understanding of the metafunctions and therefore of the system.

Moreover, it is worth noting second-order findings concerning the probability ratios. When the intersections are strong, that might indicate a more stable feature of the grammatical system, what Halliday would term a 'structural' feature. In contrast, when the associations are loose or due to chance, that might indicate an ambient which is more open to real choice, even choices not accounted for by the sample used in the experimental procedure (cf. "Patterns of instantiation are related to both systemic patterns and structural ones, which is in fact what accounts of markedness have established: markedness in a system is related to both frequency of instantiation and structural marking": Matthiessen, 2006:135).

3.3 Paradigmatic choice remodelled as syntagmatic choice

As has been discussed, the concept of choice should be considered also in relation to the paradigmatic and syntagmatic axes of language. Axial argumentation is central in SFL, and, at least in the early formulations, Halliday can be seen as privileging systems from which syntagms are derived. Another interpretation of the paradigmatic and syntagmatic axes of language with choice as the key notion is given by Tucker (esp. 1996; 2006; 2007).

3.3.1 Tucker on choice and phraseology

Tucker tries to show what is the effect of large language corpora on modelling computationally the SFL description of the system as probabilistic grammar, particularly with regard to phraseological phenomena. The premise is twofold: on the one hand, phraseological expressions (broadly including formulae, idioms, fixed and semi-fixed expressions, etc.), by encompassing aspects of grammatical and lexical organisation, support the SFL concept that grammar and lexis are aspects of the same system (Tucker, 2007:953; and cf. Halliday, 2002d:405, "lexis as most delicate grammar").[4] As Tucker further states, "There is a real sense in which phraseological phenomena challenge the conception of the language system as consisting of a set of general grammatical (syntactic) rules and principles and a separate lexicon. Phraseology aside, this conception is already challenged within a number of linguistic theories, notably Systemic Functional Grammar" (Tucker, 2007:953). On the other, and related to the former argument, idiomatic expressions somehow defy "the complex set of choices that appear to underpin the expressions (by reference to an open-ended lexico-grammar)" and these "are either no longer available or not invoked" (2007:959). Along the same reasoning lines, the realisational relationship between meaning and grammar (that is, function and form) theorised by SFL apparently gets reworked. An example discussed is the idiomatic expression *pack a punch*, where the co-selection of the two terms activates the phraseological sense as opposed to other combinations such as *pack suitcases*, *pack clothes*, etc.

However, the phraseological approach, which posits "single choices" speakers make (Sinclair, 1991, cited in Tucker, 2006; 2007), is only seemingly at odds with a systemic functional theory in which "lexicogrammatical realisation is seen as the consequence of the selection of options, as set out in the system network". The argument he puts forward is that even for single choices, which apparently defy the traditional grammatical categorisation and syntactic analyses (for example, the quantifiers *a couple of*, *a lot of*, *a bit of*, etc. are neither a word nor a group), SFL provides a grammar that can still be used to analyse them and understand variation within them (2006:85–87).

For one thing, typical features of phraseological expressions such as conventionalisation and fixedness can be accounted for from a systemic functional perspective. In fact, in SFL terms, conventionalisation can be explained as choice constrained by context – "the full potential of language is reduced under the influence of the context of culture and the context of situation" (Tucker, 2007:

[4] Matthiessen (2009:13) refers to the work by Tucker (1996; 2007) as an attempt at "filling in the details in the mid region along the cline of delicacy between the grammatical zone and the lexical", and adds that "this work has been possible precisely because lexico-grammar is modelled . . . as a continuum extending from low delicacy (high generality) to high delicacy (low generality)".

960) – whereas fixedness is the result of repetition shared by more than one speaker, i.e. socially shared repetition, acquiring what Tucker terms "socio-semantic salience" or "a speaker's identical selection of the same semantic options (and hence lexicogrammatical realisation) as other speakers" (2007:960).

For another, probabilistic grammar, and specifically the notion that one or more systems might co-occur with mutual conditioning (cf. Section 3.1.4 above), can be said to be at work not only when modelling grammar, but also when modelling phraseology. Tucker rephrases this theoretical construct as "systemic dependency" (1996:150ff.), or how choices in one system depend on choices made in other systems. His argument is explained in Section 3.3.2.

3.3.2 Phraseology and probabilistic grammar

The problem, therefore, is to "explore the relationship between *co-occurrence* and *systemic choice*" (Tucker, 2007:958; emphasis added) and to investigate how probabilities affect phraseological expressions, given that "probabilities, as will be shown, are key to the modelling of phraseological units" (2007:964).

An instance of the conditioning effect of system choices, as verified by Matthiessen, was the preferred association of certain Processes and Circumstances within the system of Transitivity. According to Tucker, the same principle can apply to idioms as well. The difference is that with phraseological expressions the conditioning effect (which Tucker also calls 'preference') can become so strong as to constitute a requirement. The example he discusses in 1996 is the expression *haven't the faintest/slightest/foggiest, etc., idea*. As can be seen, the nominal group as Complement of the verb *have* allows for some internal variation, it is not so frozen as to defy alternative forms of realisation, but the features superlative + singular are obligatorily selected. In Tucker's words, "they will be allocated a 100% preference". In other words, they will have a probability attached P = 1, which specifies "which options must be selected". In the computationally modelled Cardiff Grammar, they are a 'preference rule' or a 'preselection statement', a point of entry in the network as far to the left as possible. In this regard, the principle of systemic choice is still operating (Tucker, 1996:169). Analogously, when taking an idiomatic expression such as *my lips are sealed*, "at the point of entry into the lexicogrammar . . . the full potential range of options is no longer available" (2007:970). If the idiomatic expression is grammatically frozen, then the choice is obligatory, and a 100 per cent probability must be assigned to it. However, formulaic expressions are not always entirely frozen and show a certain amount of grammatical variation, implying that speakers still have grammatical systems from which they can choose.

To better explain the phraseological tendency, Tucker (2006) uses an analogy: just as a frequently trodden path through a forest ends up being the

preferred route, so a series of frequently taken options through the semiotic space of the system network become a single option, so "if . . . a given set of meanings, as represented in the options selected during the network traversal, is frequently adopted, the particular set of choices tends towards a single choice" (2006:100). These paths speakers take through the system network are collocation and phraseological expressions modelled as absolute or relative probabilities. When the probabilities are absolute, speakers make no choice (the intended meaning is to be expressed formulaically). Yet the structure can still be analysed; probabilities are no longer absolute, but relative to that first-order requirement; in other words, further options are available. These are choices internal to the idiomatic expression more or less constraining each other depending on the amount of variation observable in a corpus: "The precise distribution of relative probabilities is, of course, a matter for corpus investigation" (2007:972).

3.3.3 A comparative reading of Tucker's proposal

Compared to Halliday's (2005c) question concerning the frequency distribution of grammatical categories of the clause and above, Tucker shifts his interest to the probability of two (or more) words co-occuring. Halliday's idea of conditional probabilities, with the example of the choice of a Process as conditioned by the choice of active or passive Voice, is drawn upon and understood as "dependency relations within the system network" and "probabilistic correlation" (Tucker, 2006:91). However, Tucker sees phraseology as "reconstitution of the choices" such that a mixture of obligatory, that is 100 per cent probable, selection and some open, though restricted, choices apply. A further parallel could be drawn between Halliday's view of register as contextual constraint resetting the global probabilities of the system and Tucker's observation that options in the system network are selected on the basis of "higher-order" information, i.e. knowledge and beliefs, which is necessary for the "execution of a communicative plan" (Tucker, 1996:159).

Furthermore, following Halliday's computational and quantitative studies, the contingency tables containing observed frequencies are taken as probabilities because the corpus is simultaneously the place where co-occurrences can be observed and from which the system can be gleaned.

In conclusion, even though Tucker, as a systemic linguist, attempts to treat relative frequency of co-occurrence of two (or more) items as a primarily paradigmatic phenomenon realised syntagmatically, the perspective oscillates in assigning conceptual primacy either to paradigmatic alternatives or to structural elements in the syntagmatic chain (cf. Tucker, 2006:90, "modelling probabilistic, syntagmatic corpus data within the framework of a paradigmatically oriented approach to language").

3.4 Conclusions

In the first part of this chapter, Halliday's theory of choice and language variation was discussed, showing how it developed in view of the availability and growing importance of corpora. This can be recapitulated as real language use on which to test realisation statements about meaning and grammar, on which to study register variation in quantitative terms, and enabling the establishment of a relation between manifestations (frequencies) and the system (probabilities) (see Halliday, 2002d:407). In the second part, reflections on these same concepts by Matthiessen and Tucker were reviewed, showing how respectively they represent an attempt to test the idea of probabilistic grammar against corpus data and formulaic expressions. Both accounts re-examine the relation between the paradigmatic and syntagmatic axes of language. The influence that corpus and computational linguistics have exerted on SFL is such that in Matthiessen's recent wording they have led to a "reconceptualisation of the linguistic system itself as inherently probabilistic, recalling Halliday's insights into the nature of language that have informed SFL from the start, but *with a syntagmatic rather than paradigmatic orientation*" (2009:22; emphasis added). I have argued that this is detectable in both Matthiessen's and Tucker's treatments of language data.

The conclusion is that linguistic choice is postulated as a fundamental concept for essentially one reason, namely, as the way of capturing the relation holding between relative frequency in text and its theoretical significance, or the fixed and immutable state of a language evolving at a slow pace, which gets described by grammarians and social semioticians alike. Because of the difficulty in controlling and theorising the continuous movements from instance to system, from data to abstraction, from case to generalisation, choice is apt to describe both the systemic and phraseological approaches. Whether seen paradigmatically or syntagmatically, it is the trigger for language change over time and variation across media, speakers or any other human constraint.

4 Grammatical choice and communicative motivation: a radical systemic approach

Carl Bache

4.1 Choice as a systemic functional concept

In Systemic Functional Linguistics (SFL) the notion of choice is fundamental.[1] Paradigmatic relations are regarded as primary, and this is captured descriptively by organising the basic component of the grammar in interrelated systems of features representing 'the meaning potential of a language'. A language is viewed as a 'system of systems', and the linguist's task is to specify the choices involved in the process of instantiating this meaning potential in actual 'texts' through the resources available for expression in the language. Syntagmatic relations are viewed as derived from systems by means of realisation statements, which for each feature specify the formal and structural consequences of selecting that particular feature. The term 'choice' is typically used for features and their selection, and systems are said to display 'choice relations'. Choice relations are posited not only at the level of individual categories such as definiteness, tense and number but also at higher levels of text planning (as in, e.g., the grammar of speech functions). Halliday often stresses the importance of the notion of choice: "By 'text' . . . we understand a continuous process of semantic choice. Text is meaning and meaning is choice" (Halliday, 1978b:137).

It is important to note two ground-breaking decisions made by Halliday in the early development of the theory with respect to the notion of choice: (i) the decision to change the balance in the model between paradigmatic and syntagmatic relations in favour of paradigmatic relations taking descriptive priority; and (ii) the decision to let systems consist of semantic features with associated formal realisation statements rather than formal options with associated semantic characterisations. These two decisions gave choice a central role in SFL, and this role was further emphasised by the 'social-semiotic turn' of the theory in the late 1970s. It is within this general conception of language as purposeful behaviour that the model operates with lexicogrammatical choices.

[1] I would like to thank Thomas Hestbaek Andersen, Chris Butler, Peter Harder, Nina Noergaard, Uwe Helm Petersen and Miriam Taverniers for valuable comments on earlier drafts.

Just how much does the notion of choice in SFL imply in the way of deliberate, conscious selection? Is choice simply a technical term used for the inventory of systems, or should it be interpreted in social-semiotic terms as a motivated process of feature selection? Halliday is sometimes quite clear on this issue: "choice . . . does not imply intention" (1994b:4505). But often Halliday and other systemicists speak of choices in a way that implies more than just a handy descriptive convention. As indicated by Halliday's definition of 'text' as "a continuous process of semantic choice" in the (1978b) quotation above, choice tends to be described from the perspective of *the speaker or writer traversing system networks in logogenesis*, i.e. in the actual production of text (cf. Halliday, 1978b; Halliday & Matthiessen, 1999:18; 2004:43). A specific example is Halliday's account of tense choice in his recursive model of English tense (Halliday, 1976b:147f; for detailed discussion, see Bache, 2008:28ff.). The impression one gets is that choice implies *more* than the mere availability of features in an inventory but *less* than a deliberate, purposeful communicative act.

My chapter will suggest that it is indeed important to treat the speaker's choices in text production as 'communicatively motivated' and (perhaps more controversially) that it is important to reflect this *directly* in our lexicogrammar. In other words, I shall argue that in addition to viewing features as elements in an inventory we need to focus more explicitly on their potential (i.e. availability and suitability) as *motivated means to a communicative end*. In a theory of language as a social semiotic which views texts as the result of a continuous process of semantic choice in context, it is natural to look into the complex relationship between communicative motivation and the features in our lexicogrammar. For my test ground I shall examine the progressive/nonprogressive distinction as part of the broad 'tense' category in English. I shall argue that by taking a more radical systemic approach to the notion of choice in relation to this distinction, we arrive at very different results from Halliday's standard description of tense – results which challenge the traditional systemic way of modelling the sign function.

4.2 Fawcett on choice

While Halliday and other systemicists have made occasional comments on the nature of choice and on the implications of using this concept in SFL, no single published work seems to have dealt with this central theoretical issue in any great detail. However, Fawcett (forthcoming b) tries to remedy this lack of scholarly scrutiny. A considerable part of this book is devoted to a discussion of how the notion of choice is handled by the two main systemic 'architectures': the Sydney model and his own Cardiff model. Fawcett argues that while it is all right to talk of features in systems as choices in a 'product'

sense (i.e. as elements in an inventory), to do so in a 'process' sense is more problematic because it implies 'decision' and hence also 'planning'. System networks should not, he emphatically states, be considered decision trees, and both planning and decision-making belong at a 'higher level' in the descriptive model. By carefully separating process from product and locating the former elsewhere in the descriptive model, Fawcett avoids the complication of having to defend systems and system networks as psychologically, cognitively and neurologically plausible constructs. Instead, a system is a technical descriptive construct which accommodates features representing potential meanings available to the speaker or writer for selection on the basis of planning and decision-making which occur – consciously, or more often unconsciously – at an earlier stage in the production or generation of a text, and this earlier stage is to be described in a different component – 'a higher level' – in the overall architecture.

Fawcett recognises an interesting difference in how this higher level is dealt with in the two major SFL architectures. In the first kind of architecture, associated with the Sydney School of SFL, and more generally with what Fawcett calls the 'text-descriptive strand of work' in SFL, the descriptive model is structured in terms of stratification and there is a relationship of realisation between the strata. Crucially, system networks are allowed at different strata, including a purely semantic one with systems of non-formally motivated features (cf. Martin, 1987; Halliday & Matthiessen, 1999:429; Hasan *et al*., 2007; and Matthiessen, 2007). It is these higher semantic systems, and ultimately factors at the level of context, which govern the choice of lexicogrammatical features. Fawcett calls this kind of architecture 'stratal predetermination architecture'.

The other kind of architecture offered for consideration by Fawcett is the one associated with his own Cardiff school approach, and more generally with what he calls the 'theoretical-generative strand of work' in SFL. Here the description is structured in terms of components and their outputs rather than strata related by means of realisation. In the Cardiff model there is thus one (and only one) semantic component specifying the meaning potential of language. It consists of system networks of strictly semantic features and has 'selection expressions' as its output. Selection expressions enter a component which specifies their form potential. This form component consists of realisation rules and has layers of richly labelled tree structures as its output.

So where does the process sense of 'choice' fit into this model? According to Fawcett, all aspects of the planning and decision-making leading to the selection of features in the system networks are accommodated in separate components with different types of internal organisation and interrelationships but without system networks. Thus, significantly, there is a 'planner' which 'consults' 'decision-trees', and for that reason Fawcett calls this kind of architecture 'consulting architecture'. This 'higher' level in Fawcett's architecture is thus

very different from the higher-level semantics in the Sydney model in that it is intended to accommodate the cognitive modelling of the planning and execution of texts.

For the purposes of my chapter, it is important to emphasise not only the very important differences between the two kinds of architecture outlined by Fawcett, but also what they share in relation to the notion of choice. In both set-ups, choice is unproblematically used in its product sense to refer to features available for selection in basic system networks ('basic' here being used loosely to exclude higher-level networks in the Sydney model). And in both models, despite their very different organisation and descriptive goals, all aspects of the planning and decision-making implied by the process sense of choice are accommodated at one or more 'higher' levels separate from the basic system networks – even if occasionally we speak more loosely as if these networks were meant to represent the processes involved in choosing, or to map the routes the speaker takes when producing text.

4.3 Where do features come from?

The problem of accommodating communicative motivation in the overall model is not solved by relocating the process sense of choice to a higher level in the description. We need to define lexicogrammatical features in terms of their communicative potential, thus associating the lexicogrammar more explicitly with the overall systemic functional view of language as purposeful behaviour. Even if we refer any factors governing the choice of features in lexicogrammatical systems to a higher level, for planning and decision-making to make sense in a social-semiotic approach to language, there must be features in our networks which will felicitously satisfy whatever is planned and decided communicatively at the higher level, and this sets a certain standard for how we should define such features. To take a straightforward example, if a speaker (consciously or unconsciously) decides to talk about a process that took place in the past, and provided that 'past time' is part of the meaning potential reflected by the system networks of the language in question, there must be a lexicogrammatical feature which makes that choice possible. So if the (conscious or unconscious) communicative motivation is to express that a process took place in the past, the relevant lexicogrammatical feature must be defined as having that communicative effect in order to get selected. In other words, features must somehow be 'communicatively licensed' or 'tuned in' to satisfy the possible higher-level communicative strategies. As argued in Bache (2008), one way of ensuring that the features of the English tense system are defined appropriately in communicative terms is to adopt an 'instructional-semantic' perspective on features (cf. Harder, 1996; Bache, 2008:80–97). Within such a framework, the selection of the feature 'past' in the English tense system

will be subject to a realisation rule which adds the *-(e)d* suffix to the verbal stem (or generates some irregular form), and this conventional realisation will convey the 'instruction' to the addressee to 'tag process on to word-before'. Perhaps all this sounds completely self-evident, but there are in fact serious complications with it in a standard systemic framework.

So let us have a closer look at the nature of features in basic system networks and at the problem of defining them. What is a feature? Where do features come from? How do we know that a meaning qualifies as a feature in a system? How should we go about defining such features appropriately? Though these are very fundamental questions, they are rarely discussed explicitly in SFL.

If we stick with Halliday's decision to define features semantically to reflect the meaning potential of a language, and if we accept the standard SFL assumption that a language is a social semiotic whose systems are based on the idea of the symbolic 'sign function' with both an internally stratified content plane and an expression plane, it follows that the meaning potential of a language must be seen in close relation to the resources available for its expression, and that it is thus necessarily narrower than the meaning potential of language more generally. This, of course, does not mean that the meaning potential of a language is especially narrow or limited. Nor should we think of the meaning potential as static: there will always be a strong interplay between the general and specific potential, especially with contextual pressures on all communication. Also, as Halliday often stresses, there is a dynamic interdependence between text and system, with meaning always being a dynamic process, so that the two evolve hand in hand.

The distinction between the meaning potential of a language and the meaning potential of language more generally is very similar to that drawn by Hjelmslev (1993:52; 1961:57) between 'content substance' and 'content purport'. Hjelmslev defined purport as the unformed substance (phonetic and semantic) which is potentially formed as substance in language. For example, all possible vowel sounds would be an example of expression purport, while the subset actually employed (i.e. 'formed') in a language would be an example of expression substance. Correspondingly, the colour spectrum is an example of content purport. This meaning potential is cut up (i.e. 'formed') differently by different sets of basic colour terms in different languages, each set representing some language-specific content substance. Hjelmslev spoke of purport as a general-linguistic potential and substance as language-specifically formed purport. Substance, in Hjelmslev's view, is formed by content form and expression form, respectively, and together they constitute the two solidary planes of the sign function in language as a semiotic system. This sign function is necessarily language-specific and closely integrated. In SFL, as Taverniers (2011) shows, the sign-function connection between content and expression (which is defined in terms of realisation) recurs internally on the content plane in terms of a second-order content

form (features in systems) and a second-order expression form (structures encoding these features), expression here to be understood as part of a more abstract dichotomy, corresponding closely to Fawcett's form potential and what Matthiessen has referred to as "mode of expression" (2007:509). In the following, when I refer to 'the sign function', it is to this complex, stratified sign function with both the basic content/expression contrast and the more abstract second-order internal content/expression contrast within content.

Despite the mutual solidarity and interdependence of second-order content and expression (wording), this contrast is modelled abstractly as consisting of separate parts in the descriptive model: features in systems on the one hand, and their formal realisations on the other. In fact we might elaborate a bit and say that in SFL this particular part of the sign function is modelled in terms of language-specific systemic content features with language-specific realisation statements detailing the formal resources of the language, and that the meaning-to-form directionality of this modelling serves to underscore the functional and social-semiotic aspects of language in our description. If, at the level of lexicogrammar, the sign function is strictly observed as representing a language-specific potential and the formal resources for expressing this potential, one way of thinking about the higher strata (whether thought of as higher-level semantics, discourse semantics, rhetorical units, appraisal and/or context) is to associate them with Hjelmslevian purport, although with a social, cultural and ideological bias.[2] This would allow us to account for the dynamic interplay of purport, substance and content form (and indeed for the speaker's or writer's negotiation of the three for actual communication) in terms of metaredundant stratal realisation.

It is important not to be misled by this particular way of modelling the sign function in SFL. It follows from the integrated nature of the sign that it can equally well be modelled with the opposite directionality. It also follows that the meaning potential of a language, which is right at the heart of the lexicogrammatical system networks in our description, cannot be identified or established independently of the formal resources at hand. We cannot think of potential meanings without having the formal resources constitutive of text in mind. I take this to be fairly uncontroversial in SFL, given Halliday's claim that language has developed over time to serve particular functions and to be expressive of potential meanings. Halliday has formulated the dynamics and close integration of system and text very succinctly in this way: "Language creates text, and simultaneously text creates language" (Halliday, 1981:14; see also Hasan, 1987:208).

[2] For example, with its obvious cross-linguistic validity, Halliday's higher-level system of SPEECH FUNCTION would qualify as a purport system, and so would Hasan's network for options in statements (cf. Hasan *et al*., 2007:703).

I want to suggest that this close interrelationship of system and text, reflected in a fairly stable sign function, is the reason why features are often simply taken for granted: through usage they are intimately linked to the given resources and thus – superficially – transparent. But I also want to suggest that this superficial transparency can be misleading, i.e. that the sign function is sometimes much more complex and variable – even in a synchronic perspective – and that we therefore need to adopt a more principled approach to the identification and characterisation of the sign function. One reason for this complexity and variability is that the sign function is underspecified with respect to content to allow greater flexibility in handling cultural and situational pressures, thus allowing the limits of the meaning potential of the language to be pushed in new ways.[3]

The modelling of the sign function in systems and system networks with a meaning-to-form directionality, while appropriate for a model of language as a social semiotic in its final form, is inappropriate as a guideline for how we design the model from scratch and, specifically, for how we set up the inventories of systems. Given the integrated language-specific nature of the sign function, we cannot simply begin by closing our eyes and ears to ponder the question 'What are the possible meanings?' and then examine these meanings to see how they relate to each other and form domains that can be represented in systems, and then finally start to wonder what are the relevant formal means of expression in our language, if any. Even if to keep things simple we begin with a limited domain of meaning, like 'time' or 'temporal meaning', and at once come to think of three more specific potential meanings which strike us as important to be able to express in our particular culture, such as 'past', 'present' and 'future', we are likely to skew the identification of the relevant sign functions in English. Though it is not difficult to identify ways of expressing these meanings in English (e.g. the simple past form *took*, the simple present form *takes* and the combination of the modal verb *will* and an infinitive *will take*), there is no one-to-one fit between content and expression (there being lots of intersecting signs, i.e. other ways of expressing the three meanings and other more or less closely related meanings which would qualify more broadly as 'past', 'present' and 'future'). Nor is there any recognition of the very different status these expressions have formally (some being generated by means of inflectional morphology, others by means of periphrasis) and how this affects their content.

My suggestion is that when trying to identify features and the systems they enter, i.e. the meaning potential of a particular language, it is appropriate

[3] I would suggest that it is this underspecification that makes it possible for Kress to say: "In a Social Semiotic theory, signs are *made* – not *used* – by a sign-*maker* who brings meaning into an *apt* conjunction with a form, a selection/choice shaped by the sign-maker's *interest*" (2010:62; original emphasis).

to adopt a form-to-meaning directionality. As long as we recognise the sign function as a multiply stratified integration of content and expression, such an approach does not violate our functional principles. It is still possible to model the sign function with a functional meaning-to-form directionality in the lexicogrammar we end up with. But a form-to-meaning approach to the identification of features allows us to take a concrete language-specific point of departure. We need as concrete a starting point as possible. Unlike the units and elements entering syntagmatic relations, systems do not present themselves textually but have to be 'worked out' on the basis of actual instantiation in a text, and this requires abstraction. As Hjelmslev suggested (1993, 1961), to determine the 'system' *behind* the 'process' (or, more specifically: to determine the 'language' *behind* the 'text' or 'texts'), one must start one's analysis with the as yet unanalysed text (cf. discussion in Bache, 2010:2568).

All this means that, ironically, to ensure an appropriate modelling of the sign function where priority is given to paradigmatic relations and where the organisation of each system reflects a functional meaning-to-form directionality, systemic inventories must be identified in pre-established syntagmatic contexts, i.e. texts, and it must be done on the basis of a form-to-meaning directionality if we want to respect the integrated nature of the sign function.

4.4 Commutation version 2.0

Hjelmslev's concept of 'commutation' offers a practical first step in this approach to the identification of features, but, as we shall see, in a functional context we need a new, more functionally oriented version of commutation. In Glossematics the sign relation between content form and expression form is verified on all levels in the analysis of a text by means of commutation – a procedure which involves replacement of both expression and content, and which aims at identifying relevant inventories of elements. If a change of some expression leads to a change also of content, or vice versa, the result is the identification of 'invariables', in Hjelmslev's terminology. This is how in classical phonology we establish an inventory of phonemes by means of 'minimal pairs' or 'sets' (such as /sæt/ – /kæt/ – /fæt/ – /bæt/ – /hæt/ – /mæt/, etc., where a change of initial consonant leads to a change of content). Hjelmslev's other examples of inventories verified by means of commutation include the categories of tense and number, as well as colour terms (cf. Hjelmslev, 1993:67; 1961:74). When a change of expression leads to no change of content, the result is the identification of (bound or free) variants.

According to Hjelmslev, there are an infinite number of signs, and there are signs at almost all levels in the analysis of the text. In the progressive top-down analysis of the text, a low level is reached where, although the two 'planes' of the sign – 'content form' and 'expression form' – are solidary and parallel, they are differently structured at the next level down, i.e. they are not

strictly isomorphic. At this lowest level of signs, each sign is composed of a number of non-signs, the so-called 'figures'. There are a limited number of figures, and figures differ from signs in not having both content and expression, phonemes being a case in point (cf. Bache, 2010:2570). In Hjelmslev's view, it is the existence of a subordinate level of figures that characterises languages as genuine semiotic systems. Sign systems with signs rather than figures at the lowest level of analysis are not semiotic systems but symbol systems. By means of commutation, the linguist can move from the highest levels of the unanalysed text to the lowest levels of figures and thus arrive at important generalisations about the nature of language.

To illustrate the usefulness – and shortcomings – of Hjelmslevian commutation, I shall apply it to the morphosyntactic sign commonly referred to as the 'progressive form' in English (e.g. *He was running*), which is part of both Halliday's and Matthiessen's lexicogrammatical tense system (cf. e.g. Halliday & Matthiessen, 2004:335ff.) and my modified version of it (cf. Bache, 2008:115ff). In Halliday's and Matthiessen's approach, the progressive is considered a secondary present, i.e. a present that can be chosen after the first entry to their primary tripartite system with the features 'past', 'present' and 'future'. If after the selection of one of these three features the speaker or writer wants to choose again from the system, and the feature 'present' gets selected in this second cycle, it is technically known as a 'secondary present', and it is realised formally by means of a combination of a form of BE and a present participle. In my own modified version of tense in SFG, the progressive form is not the realisation of a secondary present but of the fourth choice in a fixed serial scope-sensitive system generating finite tense–aspect forms:

> past/nonpast > future/nonfuture > perfect/nonperfect > progressive/nonprogressive

The expression-syntactic realisations of this system are the following:

Choice of feature	Realisation
1. past/nonpast	± *-ed* (or some irregular form)
2. future/nonfuture	± WILL + infinitive
3. perfect/nonperfect	± HAVE + past participle
4. progressive/nonprogressive	± BE + present participle

This system generates sixteen different tense–aspect forms representing the 'core' of English finite tense and aspect. All finite tense–aspect forms in English comply with this serial system in the sense that for each choice a particular sign function is either significantly present or significantly absent, each contrast representing *a distinct choice relation*. Thus, for example, all finite tense–aspect forms in English are either progressive or nonprogressive,

and this choice has narrow scope and always follows the three other choices, which have broader scope. The serial system directly reflects not only a central meaning potential within the temporal domain but also a central form and structure potential, and thus observes the integrated nature of the sign functions involved (for detailed discussion, see Bache, 2008:115ff.). For example, if 'past', 'perfect' and 'progressive' are chosen, the structure of the expression is realised in exactly that order: we say *had been taking*, not *was having taken*, which would reflect the order 'past'−'progressive'−'perfect'.

Unlike Halliday and Matthiessen's model, where the feature 'present' is realised differently (either as Ø or as BE + V-*ing*) depending on *when* it gets selected in the process of choosing, my model recognises the unique sign function with the content 'progressive' (no matter how this is defined more precisely, see below) and the expression BE + V-*ing*, as well as the unique sign function with the content 'nonpast' and the expression Ø. This difference between the two approaches is also clear in relation to the other features: Halliday and Matthiessen's 'past' is realised *sometimes* by the regular suffix *-(e)d* (or some irregular form), *sometimes* by the combination of HAVE and a past participle; and their 'future' is realised *sometimes* by *will* followed by an infinitive, *sometimes* by BE *going to*. In my serial system, 'past' is *always* realised by the regular suffix *-(e)d* (or some irregular form), 'future' *always* by a form of WILL followed by an infinitive, and perfect *always* by HAVE plus a past participle.[4] Unless one has a unique sign function it is hard to apply commutation, which requires the replacement of a specific expression with another specific expression.

That this point is far from trivial becomes clear when we consider the implications for the actual communicative choice relations involved. In Halliday and Matthiessen's model, the choice relations involved in the primary tense system (past−present−future) may seem reasonable from a Hjelmslevian 'purport' point of view, but hardly from the point of view of Hjelmslevian 'substance' and 'form', i.e. the specific English organisation of the meaning and expression potential, which gives the contrast between past and nonpast a privileged sign-functional status. More serious, however, are the problems in connection with choice relations in their secondary tense system. If, for simplicity's sake, we just focus on the second cycle in a recursive traversal of the system, the secondary present requires the prior selection of one of the primary tenses, let us say past. Keeping the first choice of past constant, we thus face in the second cycle a choice between a 'past in past' (e.g. *had taken*), a 'present in past' (e.g. *was taking*) and a 'future in past' (e.g. *was going to take*). In what sense are these tenses choice-related? Is there any conceivable communicative context

[4] For the treatment of BE *going to* as a supplementary tense outside the core system, cf. Bache (2008:128ff.).

in which we choose *was taking* instead of *had taken* and *was going to take* as immediate competitors, as forms significantly imbuing the choice of *was taking* with meaning by way of semiotic contrast? I say no. Too many issues are at stake at once: time, completion of event, situational focus, whether the event will take place at all. No one doubts the complexity of the choice relations involved in the English tense system, but the choice relations implied by Halliday and Matthiessen's recursive tense system make little sense from the point of view of either actual communication or semiotic theory. Their model does not reflect the communicative choice relations between immediately contrasting signs and thus violates a basic semiotic principle (for more discussion and criticism of Halliday and Matthiessen's standard model of tense in SFL, see Bache, 2008:25–61).

In my model, choice relations follow from unique sign functions as reflected directly by the arrangement of features contrasted in the system: the past progressive *was taking* is choice-related to the past *took* with respect to the fourth choice (progressive/nonprogressive) and choice-related to the nonpast progressive *is taking* with respect to the first choice (past/nonpast). As an unmarked nonfuture and nonperfect form, it is further choice-related to the past future progressive *would be taking* (with respect to the second choice) and the past perfect progressive *had been taking* (with respect to the third choice). The minimal pairs are here truly minimal and sign-functionally oriented, and they can be read off the system directly.

Having designed the tense−aspect system in such a way that each feature (a specific content) is in principle realised uniquely (by a specific wording), we are in a good position to apply Hjelmslev's commutation test. However, while Hjelmslev aimed at reaching the lowest level of analysis and at establishing the relevant inventories at that level in order to formulate the strongest possible generalisations about language with a view to cross-linguistic comparisons, we are interested in exploring the nature of systems in a social semiotic approach to language. Unlike Hjelmslev, we are interested in how speakers and writers use the resources of a language in actual communication, and we should keep this in mind when we apply the commutation test. So we need a more sophisticated approach, one which tries to uncover the aspect of communicative motivation in choice relations: it is not enough to register a difference in both expression and content and then move on. Instead we must take a closer look at the difference of meaning in order to get an idea of its communicative potential.

Consider a pair of examples like the following:

(1) a. Roger *built* a garden shed.
b. Roger *was building* a garden shed.

Hjelmslev would not have been particularly interested in the distinction between (1a) and (1b), or how they were used in a real context, but he would probably

have concluded that since a replacement of expression clearly results in a change of content, *built* and *was building*, and more generally progressive and nonprogressive forms, were 'invariable' members of some inventory of signs. But in a truly functional approach we should go on to take a closer look at the *nature* of the distinction between the two expressions. One immediate difference is that while (1a) may express factual completion in the past of the situation of 'Roger building the shed', (1b) expresses the activity of building involved in this situation as directed towards, but not necessarily reaching, its completion. Communicatively we can more simply say that if the speaker wants to express the completion of the past situation, she will choose (1a), and if she wants to express situational progress and incompletion, she will choose (1b). In instructional-semantic terms, (1a) prompts the addressee to construe the past situation referred to as complete whereas (1b) prompts the addressee to construe it as an activity in progress towards completion. That this distinction is not unique to (1a) and (1b) but applies to other substitutional pairs is clear from examples like:

(2) a. Michelle *swam* across the river.
b. Michelle *was swimming* across the river.

Here Michelle is said to have reached the other shore in (2a) but not in (2b) – again a clear distinction between situational completion on the one hand and situational incompletion or progression towards completion on the other. As a preliminary analysis we can thus say that the difference between (1a) and (1b) hinges on the speaker's communicative motivation in relation to propositional content, more specifically in relation to the completion or incompletion of the situation referred to. It really depends on what she wants to say and is therefore a question of 'experiential meaning'. Note that while in both pairs the truth of the (a) example implies the truth also of the (b) example, the opposite implication does not hold: if it is true that someone was building a shed or was swimming across a river, it is not necessarily true that he or she finished the shed or swam all the way across the river.

This characterisation of the pairs (1a,b) and (2a,b) is very similar to the traditional account of the difference between progressive and nonprogressive forms, but, interestingly, it differs from Halliday's and Matthiessen's account of tense as a strictly logical resource. The problem with their account is that it does not attempt to explain the distinctions involved in terms of communicative motivation. The traditional account in terms of completion and incompletion, though sensitive to a functional analysis in terms of basic communicative motivation, is also unsatisfactory: it turns out not to be observationally appropriate, i.e. it does not apply to all the relevant data. Thus when we carry out commutation in a more extensive corpus of examples with progressive and nonprogressive forms, we find a lot of variation on the content plane, i.e. other distinctions

at play than completion versus incompletion. There are two recurring scenarios: (i) commutation may result in a *different* change of experiential meaning; (ii) commutation may result in *some* change of content, but *not* a change of experiential meaning. In a systemic functional context, this is not particularly surprising. Here are some examples of the first scenario, i.e. of other experiential distinctions in connection with the choice between progressive and nonprogressive:

(3) a. A door *slammed* behind him, a loud door.
b. A door *was slamming* behind him, a loud door.

(4) a. The lorry *stopped* for a red light.
b. The lorry *was stopping* for a red light.

(5) a. She *was* invincibly polite, trying to conceal her impatience.
b. She *was being* invincibly polite, trying to conceal her impatience.

(6) a. Roger told me he *spent* the week-end at Basset.
b. Roger told me he *was spending* the week-end at Basset.

(7) a. He paused, she *began* to cry.
b. He paused, she *was beginning* to cry.

The most immediate difference between (3a) and (3b) is that the former invites a 'semelfactive' 'punctual' interpretation (i.e. the slamming is likely to be understood as happening *once only* and as having no temporal extension), while the latter is 'iterative' (i.e. likely to be understood as expressing a temporally extensive, ongoing series of slams). In (4) the (a) example also refers to a semelfactive punctual (or near-punctual) situation, but here the (b) example is potentially 'directional' in meaning rather than iterative, referring to the durative process of slowing down in order to stop (but not necessarily coming to a complete halt). The next pair of examples demonstrates yet another distinction: (5a) offers a 'relational' characterisation (*invincibly polite*) of the subject (*She*), whereas (5b) expresses the subject's enactment of a certain kind of behaviour. So while (5a) is stative, (5b) is dynamic. In both (6a) and (6b) we have an instance of projection of what *Roger told me* but there is (in some contexts) the possibility of a clear temporal difference: in the (a) example his visit to Basset had already taken place at the time of 'Roger telling me', whereas in the (b) example this situation is simultaneous with or even posterior to 'Roger telling me'. Finally, in (7) we see a difference in the narrative sequencing of the two situations referred to ('him pausing' and 'her beginning to cry') and in the potentially causal relation between them: in the (a) example the crying is presented as beginning after the pause and as something that may have been prompted by it, while in the (b) example the beginning tears are presented as preceding the pause and as something that may have caused it. There is such

a variety of notional distinctions at play between the progressive and nonprogressive form in these examples, and it would be rather tortuous to try and impose the original distinction between completion and incompletion observed in examples (1a,b) and (2a,b) on the interpretation of (3a,b) to (7a,b) as the only relevant distinction.

The second kind of variation in relation to the progressive/nonprogressive contrast is found in examples like the following:

(8) a. They *walked* along the beach, arm in arm.
b. They *were walking* along the beach, arm in arm.

(9) a. I *had* a chat the other day with an old friend of mine from Wales.
b. I *was having* a chat the other day with an old friend of mine from Wales.

(10) a. We *celebrated* Stephanie's birthday at my uncle's the other day.
b. We *were celebrating* Stephanie's birthday at my uncle's the other day.

With these pairs, it is quite possible to think of contexts where there would be *no propositional difference* between the (a) example and the (b) example: contexts where they refer to a specific event in the past. If in (8b) it is true that 'They walked along . . . .' then it is also true, as described in (8a), that at some point 'They were walking along . . .', *and vice versa*. Here there is no difference in experiential meaning. Instead the (a) examples represent the situation referred to as a fact with no particular focus on its internal constituency, while the (b) examples (potentially) represent the *same* situation with an internal focus on its development or progression.[5] In such pairs, the nonprogressive form is used to instruct the addressee to view the situation as a whole, with all phases summed up as a unit, while the progressive form is used to instruct the addressee to dwell on the middle phase, i.e. on the unfolding of the situation. Situations like 'walking along a beach', 'having a chat with someone' and 'celebrating a birthday' are construed as 'homogeneous', with no special importance attached to a single phase (unlike e.g. *Michelle swam across the river*, where the terminal point is essential to our understanding of the situation as a complete situation, and in fact marks a point beyond which the situation cannot continue). It therefore makes no experiential difference to focus on the middle phase or to focus on the totality of phases summed up as a unit. The middle phase may as well represent the situation as a whole. So although examples (8a,b) to (10a,b) pass the commutation test – a change of expression leading to a change of content – they differ from the other examples discussed in not showing an experiential contrast. Below I shall return to the question of what kind of meaning is involved in (8a,b) to (10a,b).

[5] This characterisation is inspired by Comrie's general definitions of perfective and imperfective aspect (cf. Comrie, 1976).

In all the examples looked at so far, commutation has been applied and the result has been noted without taking the text as a whole or the context into consideration. Often the change in the content plane resulting from the replacement of the expression plane makes the sign inappropriate or simply odd in the particular text or context in which the original sign occurred. An example of this is the change of nonprogressive form in (11a) to the progressive form in (11b):

(11) a. Lisa *translated* the summary of his thesis into Spanish and returned it to the editor.
b. ??Lisa *was translating* the summary of his thesis into Spanish and returned it to the editor.

By itself *Lisa was translating the summary of his thesis into Spanish* is a possible sentence but in conjunction with *and returned it to the editor* (which presupposes the completion of the translation), the progressive form is inappropriate. The more text that is taken into consideration, the more likely commutation is to result in an inappropriate construction.

There is also another kind of complication when commutation is applied to a large corpus of examples with progressive and nonprogressive forms: sometimes the replacement of form results in a progressive form that probably would not occur in *any context* even though it is clearly part of the *form* potential of the language:

(12) a. That factory *belongs* to Mr. Hardcastle.
b. *That factory *is belonging* to Mr. Hardcastle.

As (12b) shows, we know what the nonpast progressive of BELONG would look like. But in standard British English we simply would not use it, except perhaps in very special, hard-to-think-of contexts, because it is normally associated with a more permanent state. For the purposes of this chapter, such relatively rare examples can be ignored (for discussion, see Bache, 2008:154ff.).

The problem we are faced with when examining the results of applying commutation to progressive and nonprogressive forms in an extensive corpus of examples (cf. Bache, 1985; 1997; 2008) is to determine the precise nature of the variable content plane of the two signs involved, and the possible implications for features as communicatively motivated content representatives of sign functions.

4.5 The complex content plane of the sign

As we have seen, there is a lot of variation in need of explanation. I shall argue that the following factors seem to add to the complexity of the sign function and to have implications for the way we model it in terms of systems: (i) the sign

is inherently 'asymmetrical' in the sense that the second-order content plane is vaguer than the second-order expression plane (wording); (ii) contrasting signs often differ with respect to degree of vagueness on the second-order content plane, thus entering semantic 'markedness' relations; (iii) signs are often 'non-monadic', i.e. they are multiply related to other signs, thus entering different meaning contrasts at once; (iv) the second-order content plane of a sign may be 'metafunctionally diverse'; and (v) the second-order content plane is potentially 'multifunctional'. Commutation, if taken seriously in a functional context, unearths a can of interesting worms!

4.5.1 Vagueness

That the content plane is 'underspecified' in relation to the expression plane is clear when we examine the use of a particular expression in different contexts, e.g. the past nonprogressive *stopped*. In (4a,b) above, I argued that *stopped* expressed a punctual situation in contrast to *was stopping*, which expressed a directional situation. However, both expressions would invite different interpretations in other contexts. Let us first consider *stopped*:

(4) c. I recently had my dosage of Zoloft altered, because the previous dose had just stopped working. It *stopped* very gradually over the course of a year, and I didn't even suspect it until . . . (Google search)
d. Whenever I finished work early I *stopped* by my parents' house. Those were happy days.

In (4c) the 'stopping' is no longer punctual, but takes place *over the course of a year*, and in (4d) it expresses a past habitual situation and is close in meaning to 'would stop'. The distinction between something happening once only and something happening habitually or characteristically applies more generally to the nonprogressive past (cf. Bache, 2008:107).

We also find underspecification of content in connection with the progressive counterpart to *stopped*:

(4) e. But constable, I *was* only *stopping* briefly to let off one of the passengers!
f. That week I *was stopping* by the library every day on my way home from work.

Here *was stopping* is not directional as in (4b) but expresses a much more complex meaning. (4e) refers to the whole process of slowing down, stopping, letting off a passenger and moving off, and is thus 'multi-phasal' but with an association of all the phases happening very briefly and making up a strictly temporary whole, over and done with in no time. Like (4e), (4f) is multi-phasal but in addition it refers to the stopping as a limited or temporary habitual situation, taking place a few times.

What we see in examples (4c−f) is that the two expressions *stopped* and *was stopping* are used flexibly in different contexts to serve different communicative purposes. The fact that the two expressions are underspecified with respect to the content plane makes them much more useful for the process of meaning-making in communication. But modelling this flexibility of content in our system networks is not easy, given the meaning-to-form direction. The relation of 'many possible meanings to one realisation' either requires complex feature constellations or some more abstract representation with a single comprehensive feature. Another question is *to what extent systems (including realisation statements) should represent variation of content caused by specific textual or contextual pressures*. As I shall show below, a possible answer to that question is: to the extent that we discover regular patterns in the variation that can be related to the realisation potential, i.e. within the framework of the sign function.

4.5.2 Markedness: different degrees of underspecification

As we saw in connection with (4c−f) both the past progressive and the past nonprogressive are underspecified with respect to content and thus lend themselves to flexible usage in context. However, the nonprogressive is overall rather more flexible than the progressive. Thus, in (4e) and (4f) it would be perfectly appropriate to use the nonprogressive instead of the progressive:

(4) ee. But constable, I only *stopped* briefly to let off one of the passengers!
ff. That week I *stopped* by the library every day on my way home from work.

But it would be much harder – in standard British English, anyway – to imagine a context in which it would be appropriate to use the progressive instead of the nonprogressive in examples (4c) and (4d):

(4) cc. ??I recently had my dosage of Zoloft altered, because the previous dose had just stopped working. It *was stopping* very gradually over the course of a year, . . .
dd. ??Whenever I finished work early I *was stopping* by my parents' house. Those were happy days.

This indicates that the nonprogressive is vaguer and has a wider distribution than the progressive, and that the nonprogressive is used unless there is a specific communicative motivation to use the progressive. The progressive is systemically the marked sign and the nonprogressive the unmarked sign in that particular choice relation. This can in part be shown in a system by adding probabilities (the past nonprogressive being much more frequent than the past progressive), as is conventionally done is SFL, and by allowing features the *explicit* status as unmarked member of an opposition (e.g. 'nonperfect' and

'nonprogressive'), but we also need to reflect markedness relations in our characterisation of the features as communicatively motivated options.

4.5.3 Non-monadic signs, the complex interrelationship between signs

A sign may be multiply related to other signs, entering very different contrasts with different signs. In other words, signs are 'non-monadic', in the sense that a relatively uniform second-order expression plane is matched by a fusion of (marked and unmarked) values representing different meaning domains or subdomains on the second-order content plane. Thus, for example, the past nonprogressive in English (e.g. *stopped*) is related to the past progressive (e.g. *was stopping*) with respect to one kind of meaning but at the same time it is related to the nonpast nonprogressive (e.g. *stops*) with respect to another kind of meaning, and to the nonpast perfect (e.g. *has stopped*) and past perfect (e.g. *had stopped*), etc. In instructional-semantic terms, non-monadicness means that the instructions conveyed by the speaker are typically meant to activate several semantic domains at once. From the point of view of system networks, non-monadic signs are the realisation of the co-selection of a number of different values in different (sub-)systems – again something which adds to the complexity of the meaning-to-form architecture.

4.5.4 Metafunctional diversity

Halliday has shown that lexicogrammar involves different major kinds of meanings, i.e. different metafunctions, and in our preliminary examination of the examples in (1)−(12) above, we hinted at some of these. It is therefore no surprise to find that signs may be used to serve different metafunctions in different contexts. Let us have another look at the difference between the past nonprogressive and the past progressive in (2a,b) and (8a,b):

(2) a. Michelle *swam* across the river.
b. Michelle *was swimming* across the river.

(8) a. They *walked* along the beach, arm in arm.
b. They *were walking* along the beach, arm in arm.

In (2a,b) we noted an obvious difference of propositional, experiential meaning: in (2a) Michelle is construed as reaching the other river bank, whereas in (2b) she is engaged in the activity of swimming and may or may not reach the other bank, the decisive terminal point being outside the referential scope of the progressive form. To express one experiential meaning rather than the other is very much part of the speaker's communicative motivation when having to choose between them. But how about (8a,b)? In our analysis of these examples,

we noted that in some contexts there would be no difference of experiential meaning. It is 'only' a question of the speaker instructing the addressee to view the situation referred to as a whole, with all phases summed up as a single unit, or to dwell on the middle phase, i.e. on the unfolding of the situation, with this phase being fully representative of the situation as a whole. As the situation of walking is here phasally homogeneous, there is no experiential difference between the two expressions. In some traditional accounts such examples are thought to be exceptions to a more general rule specifying an experiential distinction between progressive and nonprogressive forms. But in a truly functional, social-semiotic context we need to look more carefully into such examples and ask: Why does the speaker choose one expression rather than the other in this particular instance? What is her communicative motivation? I believe it is *a question of text planning*. By using the past nonprogressive *walked*, the speaker gives the addressee factual information which may stand more or less alone: she may or may not tell the addressee more about it. But by using the past progressive she invites the addressee to dwell mentally on the situation of walking and to expect some relationship between it and some other part of the text: there is something textually unfinished, incomplete or independent about the expression. As argued in Bache (2008:104), it may serve as a background to some other event, or as a situational frame (to use Jespersen's term), or as an introduction to an account of what happened during the unfolding of the situation referred to. The past progressive is thus *textually more cohesive* than the nonprogressive form, which indicates that the difference between (8a) and (8b) is really one of textual meaning, rather than experiential, logical or interpersonal meaning: the speaker's communicative motivation to choose one expression rather than the other has to do with the textual function of the expression in relation to other parts of the text. To conclude, when we consider the choice of progressive and nonprogressive form in different examples we find different metafunctional considerations at play governing the speaker's choice. In other words, the choice relation between progressive and nonprogressive is metafunctionally diverse. This raises the question of whether this choice relation should be accommodated in metafunctionally distinct networks at the same time, or whether it can be appropriately described in terms of a single more basic metafunctional system.

4.5.5 Multifunctionality

Having established that signs may be metafunctionally diverse, serving different metafunctions in different situations, it is only natural to expect that a sign may express two or more metafunctions *at the same time*. One of Halliday's great insights is this multifunctional nature of language – the fact that one expression may have different types of meaning at the same time. Thus, to use one of his

good examples, the traditional subject may at once be an experiential Actor, an interpersonal Subject in the Mood element, and a textual Theme. It is not surprising that signs at other levels, including progressive and nonprogressive forms, are also potentially multifunctional. The difference between (2a,b) and (8a,b) is not simply that the first pair displays an experiential difference and the other pair displays a textual difference. For although the experiential difference between (2a) and (2b) may well be a major motivating factor, the two examples *are also textually distinct* like (8a) and (8b): by using the past nonprogressive *swam* the speaker gives the addressee factual information which may stand more or less alone, but by using the past progressive *was swimming* she invites the addressee to dwell mentally on the situation of swimming, and to expect some relationship between it and some other part of the text. However, from the point of view of communicative motivation, the experiential meaning could easily have a more decisive role than the textual meaning.

Similarly, if we go through examples (1a,b) and (3a,b)−(7a,b), we find that the strong experiential distinction is accompanied by the textual distinction identified in examples (8a,b)−(10a,b). It is important to note that individual meanings from different metafunctions often go together regularly, so that if you choose to include an experientially important terminal point in your reference, you can only do so if you also choose an external situational focus. Although experiential meanings may often get the upper hand communicatively, in principle either type of meaning could be the decisive motivating factor: if, for example, it is textually important to present some situation as background in relation to some other situation, you may do so at the expense of sacrificing a terminal point referentially, even if it turns out that this point was actually reached, as in the following example:

(2) c. Michelle *was swimming* across the river when suddenly she felt sick. Shortly after she reached the other side she collapsed, never to recover again.

Here the speaker chooses to express the circumstances under which Michelle suddenly felt sick by means of a progressive form, even though it is clear from the next sentence that she did reach the other bank, i.e. the terminal point excluded by the first referring expression.

From the point of view of system networks, we are again faced with the problem of how to accommodate the distinction between progressive and nonprogressive in a descriptively adequate way that reflects its multifunctional potential and sorts out the complex, but often very regular, interplay of meanings in terms of communicative motivation. The issue which must be addressed is to what extent the asymmetry of the sign function resulting from the complexity and variability of the second-order content plane should be accounted for in our system networks, and how much should be left for higher-level

context-sensitive specification, as in both the Sydney model and the Cardiff model. I want to suggest that we define our lexicogrammatical features in such a way that (i) they apply as pervasively as possible to reflect the essence of the sign function; and (ii) that any patterns of regularity that follow directly from those definitions within the framework of the sign function become part of the lexicogrammatical specification.

Regarding the essence of the sign functions involved, the textual distinction of progressive and nonprogressive forms is a much better candidate than any of the experiential distinctions noted in our discussion of examples (1a,b) to (7a,b). While it is certainly not possible to describe an extensive corpus of examples appropriately and pervasively with reference to e.g. the experiential distinction between completion and incompletion, it is in fact possible to say more generally that the progressive form instructs the addressee to construe the situation referred to with an internal focus on the middle phase and that the nonprogressive form instructs the addressee to construe the situation referred to with an external, holistic, 'all-phases-summed-up-in-one' focus (cf. Comrie, 1976). Such a characterisation in terms of textual meanings would capture the 'basic meaning' of the two signs and would thus be observationally appropriate. But in many cases it would not capture important regular aspects of the communicative motivation of the speaker's choice of form (aspects that are in fact so regular that they have often been thought of as 'basic' or 'characteristic' of the expression form) and is therefore *not fully descriptively appropriate*. We need to consider also *regular* aspects of the complex interplay between the textual distinction and the supplementary experiential meanings that often play a decisive role in the speaker's communicative motivation for choosing a progressive or nonprogressive form. By capturing this regularity in our lexicogrammatical description, we strengthen the communicative link between higher-level semantics (or text planning) and lexicogrammar (without ruling out the possibility of contextually conditioned variation).

A careful examination of the results of commutation on an extensive corpus of examples (cf. Bache, 1985; 1997; see esp. 2008:155–174) shows that the experiential contrasts identified in examples (1a,b)–(7a,b) are fairly regular:

(a) A verb with a potential for expressing a habit or characteristic of the subject in the nonprogressive form (e.g. *Mary speaks Greek to her mother*) typically expresses a particular non-habitual situation going on when in the progressive form (*Mary is speaking Greek to her mother*).
(b) A verb with a potential for expressing a punctual situation in the nonprogressive form (e.g. *Someone tapped me on the shoulder* and *She slipped into a dark fructifying dream*) typically expresses either iteration (*Someone was tapping me on the shoulder*) or direction towards a terminal point when in the progressive (*She was slipping into a dark fructifying dream*).

(c) A verb with a potential for expressing a telic situation in the nonprogressive form, i.e. an activity or process with a crucial terminal point beyond which it cannot continue as before (e.g. *He climbed the steep dune*, *Nolan walked to the university*), expresses direction towards but not inclusion of the terminal point when in the progressive (*He was climbing the steep dune*, *Nolan was walking to the university*).

(d) A verb with a potential for expressing a projected past situation in the past nonprogressive form (*He told me that Stephanie took over the final draft of Obama's speech*, *I couldn't imagine why she married Roger*) often expresses a projected past future situation when in the past progressive (*He told me that Stephanie was taking over the final draft of Obama's speech*, *I couldn't imagine why she was marrying Roger*). This distinction is a temporal variant of the punctual/directional distinction mentioned in (b) above.

Not only do we find this regularity, but the meanings associated with the two forms are largely governed by 'compatibility' and 'markedness relations'. Thus, for example, it is hardly surprising that punctual situations do not get referred to by progressive forms, which instruct the addressee to apply a situation-internal focus: punctuality is incompatible with the basic textual meaning of the progressive (for a detailed account of the compatibility relations involved, see Bache, 2008:108ff., 150ff.). To be able to offer a full account in our system networks of the regularities identified above, one possibility is to define the progressive/nonprogressive contrast in the tense−aspect system as a purely textual one and, in addition, to set up a separate system of action types (with choices such as punctual, semelfactive, telic, habitual, iterative, directional, etc.) linked up with the tense−aspect system and activated in connection with the lexical choice of verb for an expression. I am not going to go into the specifics of these systems and the interplay between them; the point here is simply to emphasise that we need to sort out these meanings as communicatively motivated lexicogrammatical choices satisfying the speaker's higher-level decisions. By shifting the division of labour between the various levels as suggested, we can more explicitly treat lexicogrammatical features as potentially motivated means to a communicative end in our description of language as a social semiotic.

4.6 Conclusion: towards a more radical systemic approach

Systemic choice relations should be defined as relations between options lending themselves to communicatively motivated expressions. Basic systems are used to model language-specific sign functions and thus reflect a language-specific meaning potential (Hjelmslevian content substance) and the resources available for realising this potential. Higher-level meanings (Hjelmslevian content purport), including aspects of context in its widest sense and of specific

text planning, exert pressure on and dynamically interact with system networks. This is possible because of the asymmetry of the sign function and the great variability of the content plane. This variability is identified in a functionally oriented version of Hjelmslev's commutation test which takes its point of departure in a form-to-meaning modelling of the sign function, and which aims at determining the instructional−semantic nature of the forms. In this commutation test, when applied to the progressive/nonprogressive distinction, we find more specifically (i) that the second-order content plane is typically underspecified; (ii) that contrasting signs may vary in degree of underspecification and hence enter markedness relations; (iii) that signs are inevitably non-monadic, entering several sign contrasts at the same time; (iv) that signs are potentially metafunctionally diverse; and (v) that they are therefore potentially multifunctional. These many factors complicate the identification of relevant features and the setting up of relevant systems and networks in the final meaning-to-form modelling of the sign function. However, some of the complexity can be reduced by aiming at pervasive feature characterisation and a specification of general regularities in the dynamic interplay between different systems. I propose a division of labour between the strata where these things are handled as part of lexicogrammar. We should provide a fine-grained, both observationally and descriptively appropriate account of lexicogrammatical features and what could motivate their selection in text production. Other aspects of actual text planning and of the process sense of choice can then be left to specification at higher levels in the overall descriptive model. How is the approach argued for in this chapter 'more radical'? By insisting on viewing choice relations and options in terms of their communicative potential as a prerequisite to any discussion of higher-level text planning, preselection or communicative decision-making, and by trying to reflect the social-semiotic nature of language directly in the lexicogrammar.

5 Semantic options and complex functions: a recursive view of choice

Lise Fontaine

5.1 Introduction

Systemic Functional Linguistics is a model of language as a semiotic system.[1] As speakers of a language, we want to construct meaning and to convey it, and as hearers of a language we want to understand, to make meaning out of what we hear. Systemic Theory can be used to model all kinds of systems. It is used in Systemic Functional Linguistics (SFL) to model language in a functional perspective. As Butler (2009:63–64) points out, it is truly a theory of language, not only grammar, since it strives "to account for how language enables human beings to communicate with one another in the ways they do".

The semiotic system for language is modelled by a network of meaning potential, as Halliday (1978b:40–41) explains: "The network consists very simply of a set of interrelated systems . . . a semantic network is a representation of semantic options or choices in meaning." According to Fawcett (2000:324), this representation of choice lies at the heart of systemic linguistics. The notion of choice somehow encompasses everything important to systemic linguistics. Making meaning is making choices (Halliday, this volume).

5.1.1 Aims

The central aim of this chapter is to contribute to the disambiguation of choice by considering this concept from two different views. The first concerns the system network where choice is seen as the available semantic options (i.e. a term in a system), which involves classification. The second concerns the language system where choice is seen as the process of selecting options. With these two perspectives in mind, choice will be (re)defined in two related but distinct senses as a simple term and a complex function.[2]

[1] I'd like to thank Yves Kodratoff for very helpful comments on this version. I would also like to thank the anonymous external reviewer who offered very useful suggestions which have improved the quality of this chapter.

[2] 'Complex function' is used here in an analogous sense to the concept of mathematical complex function (cf. complex dynamics). The role of recursion in the process makes it a complex function.

5.1.2 Organisation of the chapter

Section 5.2 of this chapter will review why choice is at the same time a very attractive central concept and a somewhat problematic term in the theory of Systemic Functional Linguistics. Section 5.3 discusses choice as a simple term by considering relationship in the system networks. Then, in Section 5.4, I offer an account of choice as process in language production, where my central argument is presented. The discussion draws on the distribution frequency of referring expressions in three small corpora. I try to reconcile perspectives from psycholinguistics, corpus linguistics and computational approaches to language in order to offer an interpretation of the significance of probabilities in relation to system networks from a language processing perspective. Finally, the chapter concludes in Section 5.5 with some closing remarks.

5.2 The problem with choice

SFL has shown itself to be extremely attractive, to both linguists and non-linguists. Its use is widespread from educators to cognitive scientists and almost any area imaginable where a linguistic approach would be needed. The variety in the list of bibliographic references of work done within systemic linguistics is proof enough, but also, references to Systemic Functional Linguistics outside systemic linguistics is impressive. One of the main reasons for this is the role of choice in the theory.

Even though it is well known that the centrality of choice in SFL is one of its main strong points, it is not without issues and problems. The problem seems to be due to two main factors. The first concerns the ambiguity of the polysemy inherent to the lexeme CHOICE, and the second is the result of a lack of consistency in its use. This has been noted by various authors. Fawcett (1992:641) wrote that "systemic linguists need to make it clearer in their writings that this use of the term choice does not necessarily imply 'decision'". If its use is recognised as problematic within the SFL community, then the way in which this core concept is interpreted outside it is perhaps even more important.

For example, Winograd (1983:289), as discussed below, felt it was inappropriate to think of 'choice' as active choosing. As he pointed out, the classification inherent in the networks "is being imposed by an observer". However, since, as he concluded (1983:289), "the term choice is standard in discussions of systemic grammar", there was no way to avoid using it and the term was adopted in his computational approach "in spite of its connotation of intentionality".

Halliday himself has never claimed that 'choice' means active choosing or deciding. However, in SFL writing there does appear to be a lack of clarity

about the term which leaves the theory open to misinterpretation and misunderstanding. In Halliday's earlier writing, he states clearly that "the semantic system is a network of meaning potential. The network consists very simply of a set of interrelated systems . . . a system is a set of options, a set of possibilities . . . Hence, a semantic network is a representation of semantic options, or choices in meaning" (Halliday, 1978b:40–41). This meaning potential held within the network of interrelated systems represents the semantic options (or choices) available in the language. The term 'choice' is still there and yet this term is still causing problems.

Butler (2002:65–66) refers to "systematic ambiguity" in the use of meaning potential, calling it a "slippery" term with two interpretations:

- "the potential offered by a set of choices which are themselves choices in meaning";
- "a set of choices which themselves have the potential for realizing meaning".

The slipperiness is not due to meaning potential but rather choice, as can be seen from the two interpretations. Clearly, the two terms 'choice' and 'meaning potential' are interwoven.

Even with the writing of Tucker (1998), who has in my opinion written most clearly about the system network and choice, the notion of 'choice' is open for variable interpretation: "a system network displays the choices in meaning which can be made, and which lead to a possible realization at the level of form. What they do not do, and cannot do, is provide the basis for these choices" (1998:41). It would be possible to infer from this that choices are made, and this could lead one to think that choice is an active process; i.e. choices are made by the speaker – and this almost sounds like 'deciding'. For Halliday (see Halliday, this volume), the problem is not with the term 'choice' but with any semantic association of the term with decision. Choice, for Halliday, is more appropriately considered as selection (in a Darwinian sense) rather than as decision (see Butt *et al*., this volume).

Winograd (1983:279) offers an interesting discussion of the use of choice as a term, and cautions against using it before reluctantly resigning to its use:

> We have carefully been using words like 'classify', 'alternatives' and 'describe' avoiding the term 'choice', which is more commonly used. This was to emphasize the fact that the classification is being imposed by an observer – someone who is describing the form and use of utterances. One can talk about the classification of animals by a biologist but it hardly seems appropriate to talk about a system of 'choices' in the sense of an active choosing. Similarly the categories and features assigned by a systemic grammar are not a hypothesis about a structure that exists in the mind of a language user who makes choices in putting together a sentence or in understanding one that is heard.

However, even after a lengthy explanation of why the term 'choice' is unsuitable, he admits that given how strongly integral the term is to SFL theory, it

should be used "in spite of its connotation of intentionality" (1983:289). Somehow, connotations of intentionality, decision-making and active choice have imbued the term, and this has permeated the SFL literature, something which has been acknowledged by Fawcett (1992:641), who states clearly that there has been some ambiguity about the idea of modelling choice in system networks: "In many writings in the SFL literature (my own included) the misleading impression has been given that, because system networks are a natural way of 'modelling choice', the system networks themselves are decision-making mechanisms."

Other scholars have noted this problem as well. For example, Patten (1993:202) notes that "[the system] networks are formally classification hierarchies, but historically there has been a tendency among systemic linguists to informally interpret them as some sort of flowchart, and talk about making 'choices' while traversing the networks". As already stated, the system networks are a representation of meaning potential and clearly choices are not made within them.

Whether or not we agree with these views and interpretations, they do highlight two underlying issues related to some lack of clarity in the literature. One relates to the interpretation of the term 'choice' itself and the other concerns the interpretation of the system networks and what happens with them. In order to attempt to resolve some of the problems, we need to tease out from within the term 'choice' the polysemy related to the senses of 'option' and 'process', which is the aim of this chapter.

5.3 *Choice* as a simple term in SFL

The difficulty of defining terms is well known. Even if Halliday never intended 'choice' to be interpreted in relation to 'decision', it ends up being talked about with this meaning implied. As Fawcett (this volume) points out, 'choice' implies 'choosing' and 'choosing' entails 'deciding': "choosing (like many lexical verbs) is a complex process, involving not only 'deciding' but also 'wanting' and 'coming to have'." This kind of lexical analysis is unlikely to offer understanding since, as Andersen (2002:166) points out, lexical look-up can lead to a cycle of "we seem to never get out of language into reality". The reality in SFL is that choice is at the heart of system networks, so it seems appropriate to look to them to see if they can shed light on the term 'choice'.

5.3.1 System networks

Halliday has discussed and defined 'system' in many places over the past fifty years. One relatively early description was given as follows:

A system is a set of options with an entry condition: that is to say, a set of things of which one must be chosen, together with a statement of the condition under which the choice is available . . . The system network is the grammar . . . an arrangement of options in simultaneous and hierarchical relationship. (Halliday, 1976e:3)

To access a set of options (a system), a condition must be met, and for every system, one option must be selected. Following on from this, Halliday describes the system networks as one of formalisation:

[T]he grammar is based on the notion of choice. The speaker of a language, like a person engaging in any kind of culturally determined behaviour, can be regarded as carrying out, simultaneously and successively, a number of distinct choices. At any given moment, in the environment of the selections made up to that time, a certain range of further choices is available. It is the system that formalizes the notion of choice in language. (1976e:3)

This description presents choice as a kind of process (i.e. selection, the process of selecting some options and not others), although one would be forgiven for interpreting this use of choice as decision (in the sense of active choosing). Choice is also being used to refer to options (i.e. further possible choices or the available options). This passage could perhaps be rewritten as follows:

The grammar is based on the notion of ***choice***. The speaker of a language, like a person engaging in any kind of culturally determined behaviour, can be regarded as carrying out, simultaneously and successively, a number of distinct ***selections***. At any given moment, in the environment of the ***selections*** made up to that time, a certain range of further ***options*** is available. It is the system that formalizes the notion of ***choice*** in language.

There isn't space to present the system networks here in any detail but they are discussed in other chapters in this volume (e.g. Halliday, Gil, Castel and Berry).

We can see that 'choice' is being equated to (semantic) option (cf. a "term in a system", Halliday, this volume). The system network is a representation of the available semantic options (which are organised as interrelated systems). A simple system might have only two semantic options, such as the POLARITY system (see Halliday, this volume). However, the system network, representing all related systems, such as the THING network (see Fontaine, 2008) is complex and difficult to represent graphically. What is or is not a choice in the system network is a classification problem, and as Bache (this volume) makes clear, this is not a straightforward problem.

In addition to the semantic options in the system network, there are two key features of systems that need to be included in a full description of the system network. These are the entry conditions and the realization rules (or statements) associated with each system and the probabilities associated with each semantic option. Due to constraints of space, this chapter will not deal

with the realization rules and entry conditions, and the role of probabilities will be covered only briefly in Section 5.4.3.

While the discussion of choice has clarified the notion of choice as an option, in the sense of paradigmatic choice (see Halliday, this volume), it does not tell us anything about how choice happens. In other words, we don't have an understanding of the process of choice. As Tucker (1998:41) makes clear, "a system network displays the choices in meaning which can be made, and which lead to a possible realization at the level of form. What they do not do, and cannot do, is provide the basis for these choices." Although this chapter will not explore the details of how choices are made in terms of the factors involved, we will now turn our attention to one view of choice as process.

5.4 Choice as process

If the system networks do not provide the basis for these choices, what does? How can a speaker carry out, simultaneously and successively, a number of distinct choices? This is an area that has been studied at great length by computational linguists.[3] It is generally accepted that the selection process or decision-making process is one that is developed in a component that can be thought of as a kind of planner, where language planning takes place (see Fawcett, this volume, for a discussion of planners). The most widely accepted proposal for handling tasks such as selection is a component called the 'microplanner'. According to Reiter and Dale (2000:124) there isn't consensus on exactly what tasks belong within the microplanner (as opposed to document or discourse planning) or in what order tasks would interact, but it is generally accepted that "microplanning is concerned with those tasks that require attention being paid to interactions between domain knowledge and linguistic knowledge". Essentially, then, selection in terms of producing a clause is handled in some kind of microplanning component.

This is not only a feature of computational language production; psycholinguistic models of language production also include such a component. In fact the concept of microplanning and macroplanning originated in Levelt's work (e.g. Levelt, 1989).

The microplanner can be viewed as a particular methodology of manipulating various types of particular knowledge and as a means of selection from among available semantic options. In the Cardiff model, the microplanner component guides choices (Fawcett 1992; this volume; Fontaine, 2008). Without

[3] Although I am not a specialist in this area, even computational systems of language production do not seem able to deal with simultaneity, except perhaps genetic algorithms which take an evolutionary approach.

attempting to describe the microplanner here, we will simply assume there is some mechanism for planning that constitutes the selection process, and which governs, in some way, the selection of the semantic options (choices). Perhaps a greater assumption being asked here is that all language production, whether human or computational, requires some higher planning component, although there is no reason to think that they operate in the same way. Perhaps by considering this in the light of the contributions by Gil (this volume) and Asp (this volume), we may not be far off providing some concrete proposals within systemic functional theory.

5.4.1 Language as process

For language analysts, there are two main ways to consider language: as product (text) or as process (language). When viewed as product, choice, as semantic option, can be deduced from the available text (and context). However, the view of language as process requires some sense of language modelling, otherwise the process cannot be captured and described. As Lamb (1999:62) points out, "the important thing to realize is that [the word] is not an object. The word that comes out of a speaker's mouth comes out because a particular portion of network gets activated". What is behind any text is a complex selection[4] of semantic options. In fact, the product (text) is a representation of the process at a particular state.

This distinction between process and product is extremely important but it raises problems of its own. Andersen (2002:200) describes the problem as follows: "the model describes wholes as emergent entities, generated by the activities of the parts, but does not specify the relationship between the new macro behaviour and the micro behaviours that created it." A text (or clause) behaves like a unit, like a whole, but it is so very different from any of its parts (2002:39). It is a challenge to successfully account for the interaction of the parts in creating the whole.

Trying to account for the interaction of the parts in a language system is challenging (see Freddi, Berry, Teich, this volume), and it requires a view of language as complex system (see Butt *et al*., this volume; Lemke, 1993; Andersen, 2002; Smith, Brighton & Kirby, 2003; Halliday & Martin, 1993). Some would go further in considering language as a complex adaptive system (Steels, 2000). The nature of complex systems is such that recursion is necessarily a central notion. Therefore, to understand choice as process in a complex system we need to consider the place of recursion in relation to choice, which we will come to in Section 5.4.2.

[4] It may make more sense to think of 'activation' rather than 'selection' in language production.

5.4.2 The simultaneity of choice

We will now briefly take a look at a bigger picture of the language system. If both choice and recursion are at the heart of the linguistic system, how do they relate to each other? Choice is a difficult term to define without a certain degree of recursivity (or at least circularity) in its definition. Alluding to a well-known, tongue-in-cheek definition of recursion, it is almost as if to understand choice, you must first understand choice.

Recursion has been studied at great length in terms of generative syntax rules (e.g. A → AB). However, recursion does not lie in the structures that are considered as outputs of the language system. As Fawcett explains (1980:182n), "it is not the structures that are recursive", the "rules" may be applied recursively, but this is not the type of recursion that we are interested in here.

Most linguists are studying language as product, i.e. text. However, language, when considering choice, is best viewed as process (see O'Donnell, this volume). This is not to reject in any way the important work of descriptive linguistics and corpus studies (cf. Berry, Teich, this volume) and indeed I rely on this in what follows. As Berry (this volume) stresses, "analysing texts can show what choices have been made, in what contexts, even if it cannot show by what mental processes or in what order". And in this sense, the output of the language system (language as product) masks the network. The output is a representation of the process at a particular state; it is static. Language production is dynamic.

Winograd also considers language as a complex system, but tries to treat it as "nearly decomposable" (1983:152) and considers that language can be decomposed into "nearly independent components" (1983:152), arguing that it would be nearly impossible to do otherwise. In order to try to gain a deeper understanding of one aspect, it needs to be, temporarily at least, treated as "nearly" independent from the rest of the system. However, it is only when it has been refined and returned to its place in the system that we can evaluate the success of the results.

5.4.2.1 Choice in language production

For any given sentence a speaker is likely to have to work out at least some of the following things:

- how to refer to the objects involved so that the addressee can identify what is being talked about;
- how to lexicalise the ideas that he or she wants to express;
- how to begin.

These tasks relate loosely to what are known more technically as 'referring expressions' (expressions that are used to refer to participating entities), lexicalisation (selecting lexical form) and Theme selection (how to begin). Most

work on how these tasks relate to each other has been done within the field of computational linguistics. Even if computational models cannot be shown to be cognitively/psychologically valid, they do provide a means of testing whether a given model works.

According to work done by Reiter and Dale (2000:123–124), "it can be argued that these three tasks lexicalisation, aggregation and referring expression generation are not at all independent of one another". However, the exact nature of the relationship among them is far from clear. Reiter and Dale (2000:166) suggest that lexicalisation is likely prioritised over aggregation (a kind of merger, like co-ordination, e.g. *the cat and dog*), yet their algorithm for lexicalisation asks whether or not two messages have been aggregated, which cannot be asked if lexicalisation happens first (2000:166). This is a problem that is still unsolved[5] (see O'Donnell, Cheng & Hitzeman, 1998, for example, and Zock, 1996, in particular).

This is a big problem because if we can't figure out how to combine these tasks, we cannot even begin. It is usual to just assume that one task must happen first. To show how this works, an example is used to discuss the impact of this problem on our understanding of choice. The example used here is taken from Fawcett (1998), where an algorithm for generating Theme is presented.

Fawcett's example presents the following context: a person named Ike has a stomach-ache and his roommates are wondering what happened (see Fawcett, 1998 for details). So we need to know loosely what information we have before decisions are made in the microplanner and therefore before we generate the sentence through the remaining components of the grammar. Let us simply assume that we know the speaker intends to express a situation involving a process and two objects. We'll also assume we know the process is EAT and that we know that the event is in the past. We also know that the first object (Agent/Actor) is named Ike and that the second object might have been an egg.[6] Following Fawcett (1998), we might expect to be able to generate one of the following clauses:

(1) Ike ate the egg.
(2) The egg was eaten by Ike.
(3) It was the egg that Ike ate.

This seems reasonable. However, we have not considered the process of producing each clause. What would be the effect of changing the order in which

[5] I am not aware of any cognitive or psycholinguistic work that could shed light on this, which is why, for the sake of the discussion, I am relying primarily on developments in computational linguistics. This field is our main source for model testing.

[6] It is misleading to rely on lexis at this stage, since lexicalisation would not yet have taken place; ideally we should use conceptual images. We can't know a priori what type the referent will be categorised as, although 'egg' is highly likely, but perhaps 'leftovers', 'lunch', etc. are possibilities.

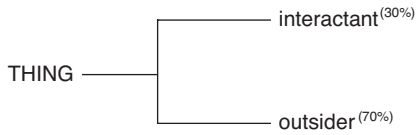

Figure 5.1. Simplified THING network

the tasks mentioned above happen? Should the referring expression be built first? Since there are two in this example, which one would be built first? Would this be dependent on which one came first in the intended sentence? In other words, does it depend on whether or not it will function as Theme? What about which lexical items to select?

5.4.2.2 Choice and probabilities: an illustration

The semantic options in a system are usually well motivated in the sense that certain options are more frequent than others generally (e.g. unmarked Theme is considered more frequent than marked Theme), or they are preferred over others (e.g. in certain contexts, interactant is preferred over any other referring expression). This kind of knowledge in encoded in the systems by the use of frequency probabilities.

As an example, a simplified system for THING is given in Figure 5.1, where the associated frequencies for each option are given in parenthesis (from Fawcett, 2004a).[7] The initial entry condition for this network is THING (i.e. the system is entered to produce a nominal group which is being used to refer to some entity). Selection of the interactant feature would lead to expressions such as *I*, *me*, *you*, and the outsider feature would lead to expressions such as *he*, *she*, *Jane*, *the dog*.

To illustrate how these probabilities look in text, empirical work reported in Fontaine (2008) will be used to illustrate potential dependencies within the full system network. The data sets used are described here briefly. The GAE text (4,824 words) is an archive of personal informal email messages (mother to daughter); HES (4,391 words) is a different archive of personal informal email messages (friend to friend); and finally MFN (4,692 words) was taken from an educational brochure. Table 5.1 shows the distribution frequency of the structural realisation of referring expressions, where the use of THING, SITUATION and DESCRIPTION indicates respectively: 'referent regarded as thing', 'referent regarded as situation' and 'referent regarded as quality' (Fawcett, 1980:93). The distribution of referent type is remarkably consistent across all three text

[7] Berry (this volume) has incorporated referring in her Subject Theme network, which may in fact capture some of the issues being raised here.

Table 5.1. *Distribution of referent type*

	GAE		HES		MFN	
Total N	1673		1169		552	
	Frequency (%)	N	Frequency (%)	N	Frequency (%)	N
THING	89.2%	1492	83.9%	981	84.4%	466
SITUATION	3.1%•	52	5.1%•	60	11.6%•	64
DESCRIPTION	7.7%•	129	10.9%•	128	4.0%•	22

Key for levels of statistical significance: • 98% degree of confidence.

Table 5.2. *Frequency of 'outsider' vs. 'interactant'*

	GAE		HES		MFN	
Total N	1491		981		466	
	Frequency (%)	N	Frequency (%)	N	Frequency (%)	N
OUTSIDER	74.0%•	1104	81.7%•	801	100.0%	466
INTERACTANT	25.7%•	383	17.9%•	176	0.0%	0
SOUGHT	0.3%	4	0.4%	4	0.0%	0

Key for levels of statistical significance: • 98% degree of confidence.

sets, showing a particular concentration of 'referent regarded as thing' (i.e. realisation of nominal group as an element of the clause).

The frequency distribution of the features 'outsider' and 'interactant' are given in Table 5.2, where we can see that the MFN text has no occurrences of interactant at all and there is considerable variation between the GAE and HES text sets. Given the formal print-based text type for the MFN text, we might have expected that the feature interactant would be set to 0% probability (cf. Berry, this volume). This would have been predetermined in the planning component during language production (cf. Urbach, this volume, and the role of context during planning). However, GAE and HES texts did vary significantly, although the GAE text set is close to the predicted probabilities given in Figure 5.1.

The GAE text set was sampled at three different time periods which showed considerable variation for an individual speaker: the range of outsider reference in GAE across the time periods was from 69.9% to 80.9%, whereas the range for interactant was from 30.1% to 18.5%. The selection of one option over another is not stable for a particular speaker and these results suggest significant

Table 5.3. *Distribution frequency of 'outsider' and 'interactant' across grammatical function*

	Subject				Complement				Circ. adjunct			
Feature	Mean	N	TStat	Sig.	Mean	N	TStat	Sig.	Mean	N	TStat	Sig.
	758				475				258			
outsider	54.75%	415	9.30	98	92.00%	437	3.76	98	97.67%	252	7.16	98
interactant	44.85%	340	21.97	98	7.79%	37	13.00	98	2.33%	6	9.82	98
sought	0.40%	3	1.19	–	0.21%	1	0.48	–	0.00%	0	0.94	–

variability within the same text type. The factors contributing to this are complex and beyond the scope of this chapter, but likely point to contextual parameters.

The frequencies of these features become interesting when their distribution across grammatical position (i.e. Subject, Complement, Circumstantial Adjunct) is considered. Table 5.3 shows the frequency percentage of outsider and interactant for the GAE and HES texts combined when grammatical function is considered.

These results show that the frequency probabilities are sensitive to grammatical function. It would seem that nominal groups expressing a Complement function are far more likely to have the selection of the outsider option. Furthermore, for this text type, there is a strong suggestion that Subject allows for almost free variation. A similar finding is reported in Fontaine (2008) concerning ad hoc modification (i.e. whether a nominal group includes one or more modifiers or qualifiers). For the email texts, nominal groups with modifiers dispreferred Subject position, whereas in the MFN text, the inverse was true. This would suggest a systemic dependency between options related to modification and other system options, such as Subject (irrespective of where Subject is available as a feature, i.e. which system). This is directly relevant to the question of Theme selection mentioned briefly above.

This is a very cursory look at these probabilities, but the point being made is that the probabilities of semantic options within system networks must be dependent probabilities (cf. Freddi, Teich, this volume). If we return to the examples discussed above with this in mind, we will then see that the questions asked about what should happen first are not so easy to answer, and indeed are likely to vary from speaker to speaker depending on a variety of factors including context. Specifically in the case of outsider reference, is it more important to know whether the expression will include a modifier or whether it will be expressing Subject. What is the nature of the dependencies?

Consider the following additional sentences (invented for the purposes of discussion):

(4) Ike ate that old egg.
(5) Ike ate the rotten egg that was in the fridge.
(6) That idiot ate the egg that I was saving for my supper.
(7) The rotten egg was eaten by your stupid brother.
(8) He ate the egg that was in the fridge.
(9) He ate the egg that I had forgotten in the fridge.

We can now look at this again with emphasis on a word used in Halliday's (Halliday, 1976e:3) description of the grammar: "The system network is . . . an arrangement of options in simultaneous and hierarchical relationship." If system options are in a simultaneous relationship then this might lead us to consider mutual dependency, which may require parallel processing.

What if all these operations concerning lexicalisation, referring expression generation and Theme selection were made simultaneously?

When faced with the problem of trying to work out what to do first because the components are so interdependent, it may be useful to consider the problem by looking at it in another way. If we assume that the process of choice in language production is recursive, then we can start thinking in terms of having all of these components or elements come together at once, simultaneously. This will be explained in Section 5.4.2.3.

5.4.2.3 An epistemological view of recursion in language: towards Halliday's simultaneity

The mere urge for successful communication can explain why language becomes compositional, hierarchical and recursive: because these features allow the re-use of already established bits of language which in turn increases the chance that at least part of the message is conveyed successfully. (De Beule, 2007)

The above quote is interesting because it suggests that linguistic recursivity is part of an evolutionary process. Fraňová (2008) argues that recursion is a fundamental key to the understanding of human creativity and of conceptual complexity. It is also a fundamental key to the understanding of human language. Based on studies considering the modelling of complex systems, it becomes clear that these methods are not unlike the modelling of language. The language system evolved; this is not disputed even though there is no universal agreement on exactly how this happened. There is an important understanding to be gained in thinking about this 'becoming' and how it can function. Le Moigne (in Fraňová, 2008:376, my translation) talks about a kind of dialectic that is constitutive of all complexity: "to become while functioning and to function while becoming, while maintaining its identity." This so-called 'dialectic' nature of complex systems is by nature recursive.

Before going into further discussion, we can think of recursion simply as a particular method of conception and of realisation (Fraňová, 2008). However,

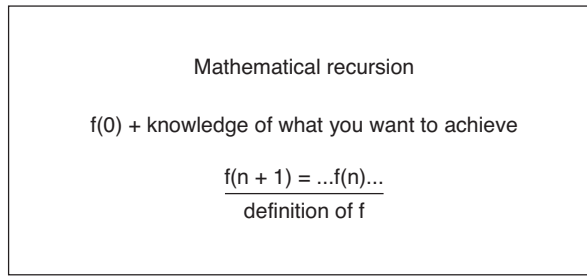

Figure 5.2. Representation of mathematical recursion (Fraňová, 2008:358)

as a method of conception and of realisation, recursion is not a simple method; it is complex.[8] Its understanding can be broken down as follows (Fraňová, 2008:18–19): recursion is a particular representation of a particular short-cut of a particular infinity.

In the examples given in Section 5.4.2.2, there are fundamentally two objects to deal with: one is <+male, +human> and the other is <+object, +edible> (or some such conceptual description), and there are a variety of ways that they can each be expressed. The question is not which comes first, Ike or the egg, but rather how can they both be there at the same time. They need to be for the probabilities to work, otherwise one has to be there first and then it would determine the other. Within a recursive framework, they can both be there at the same time. This is the key to understanding recursion, and this is why an epistemological view of recursion is needed.

The notion of function, by analogy from the mathematical sense, allows us to model the efforts made in accessing a precise value from given arguments. Humans can naturally and readily conceive an algorithm to go from a desire to a realisation, passing through some (temporary) idealised version (Fraňová, 2008:34, 377). In wanting to communicate something, we do exactly this. This can be formalised as a case of mathematical recursion as shown in Figure 5.2.

It is difficult to explain a recursive function logically; in effect, according to Fraňová (2008:377), f(n) is a kind of hypothetical knowledge – it talks about f before f is realised. It is a kind of cultural explanation which helps us to understand recursion in the sense that f(n) can be realised in a recursive process of becoming while functioning and functioning while becoming, maintaining its identity. This kind of cultural explanation helps us to understand recursion. Language is a system that had to become while functioning and function while becoming, maintaining its identity. This can also be said to apply for each

[8] The term 'complex' is being used here in opposition to 'simple' (as in simple function vs. complex function) in order to capture the interconnected or mutually related parts of the recursive process.

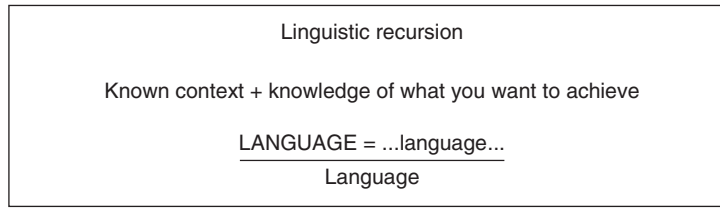

Figure 5.3. Representation of linguistic recursion

instance of language production but at a different level (e.g. the higher planning components need to 'talk about' <Ike> and <egg> before they are realised). The description of mathematical recursion can then be used by analogy to apply to linguistic recursion as shown in Figure 5.3.

A recursive process is one whereby one is working with notions that are not yet limited or finite; the delimitations are known only at the end (Fraňová, 2008:359). Whatever is produced is recursively constructed in a cyclic passage between what can be called an idealised goal or desire and what we know how to do. This can be applied both to a single utterance and to the system itself. How might this work?

There is a methodology that can account for this kind of complexity and it explains the recursive 'parts <–> whole' relationship. Constructive Matching Methodology was developed by Fraňová (see Fraňová, 1990). It can best be thought of through the analogy of a puzzle, where rather than fitting one piece to another, all the pieces are worked upon simultaneously until, at the end of the operation, they all come together at once. It gives the ability to construct something while the pieces are being mapped together, simultaneously.

Using the puzzle analogy, the whole is the unit or phrase we are trying to generate, and the pieces, in our example, are the various operations (which will also involve pieces) that must be performed: e.g. Theme selection, referring expression generation, and lexicalisation. All of these must be worked upon simultaneously until they come together, at once, at the end of the operation. It must be noted that these tasks (or operations) involve choice in SFL terms. In Section 5.4.3, it will be argued that choice, seen as process, is a recursive function.

5.4.3 Choice as a recursive function

What I have been suggesting is that the process of selecting a semantic option (i.e. choice as process) in the generation process is a recursive function. What I am explicitly suggesting is that the recursivity in the process of choice is part of what has to happen in the higher-level planning components. This can be shown

very generally and simply by analogy using the famous three doors example (or the Monty Hall problem), commonly thought of as a classic cognitive illusion. There are significant differences between the three doors example and a language generation example, but language generation examples are so lengthy and complex[9] that hopefully the reader can accept the stretch which is necessary to see the analogy, and humour me on this excursion. This example assumes a very high degree of agency in the 'chooser' role and as this is discussed extensively in this volume (e.g. Halliday, Butt *et al*., Asp and Berry, to name a few), I won't discuss the issue here.

The three doors example is taken from the *Let's Make a Deal* game show, hosted by Monty Hall from the 1970s. In this game, a contestant is presented with three doors, each one hiding a prize. The object of the game is for the contestant to select the most valuable prize. There are two stages to this game; in the first stage, a door is selected. Then the contestant is given more information (one of the non-selected doors is opened), and in the second stage the contestant is asked to select again. At this point, he or she can either keep their first selection or change their mind.

For the purposes of this discussion, let us assume that this is a system of three options, each with an equal probability. For example, this could be seen as similar to a simplified representation of the modality system (modality: → high/median/low) or the outsider system in the THING network (outsider: → name/pronoun / ad hoc description). Let us also assume that this is a kind of simulation of the selection process. The contestant, who is like a speaker, has an objective, and desires to find the door with the best prize. For this example the contestant will be male for ease of reference. We will also assume that he will come up with an algorithm (likely novel and ad hoc) to handle the selection process (i.e. in all cases something must 'happen' for an option to be selected, whether this is conscious and deliberate or not). Factors the contestant might consider include what has happened on previous shows (similar to likelihood or estimated probability) and/or what position he prefers, as in right, left or middle (similar to preferences, habitual selection).

Regardless of how the contestant works out the selection, one door will be selected. In this example, we will assume that Door 3 has been chosen, for whatever reasons, as shown in Figure 5.4. This completes the first stage of the selection process.

Now, as part of the game, one option is revealed to no longer be an option (somewhat similar to a speaker using the delete key, as in O'Donnell, this volume), i.e. one door is opened and shown as not desirable, which is like having the probability set to 0%. The selection process is not yet complete.

[9] For examples of how the process of choice might work in language production, see Fawcett (1992).

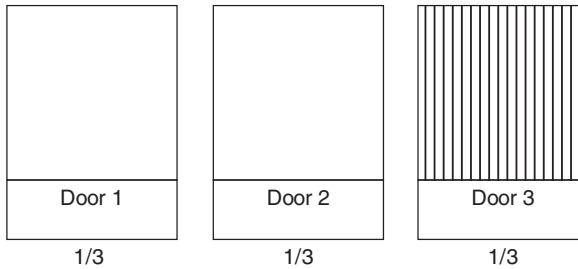

Figure 5.4. Initial selection (choice)

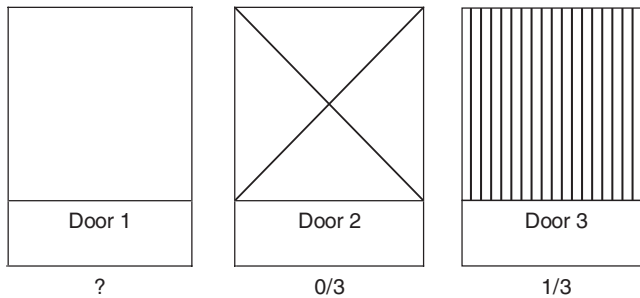

Figure 5.5. Reconsidering selection (choice)

By analogy to language, this would be like realising that, for example, high modality or use of name would not be desirable in the current context. Here, we will say that Door 2 has been opened. Now Door 2 is no longer an option and it can no longer be chosen, as shown in Figure 5.5. But it is clear that this option would have been undesirable, given the goal.

However, the options available to him now are to keep his first selection or to change it. Being the recursive thinker that he is, he decides to reject his initial selection and now select Door 1. In this process, he could only select Door 1 because he had already selected Door 3 (the selection of Door 1 is dependent on the previous stages of selection). The probability of success in the initial stage of selection was $1/3$ for Door 1, leaving $2/3$ for the remaining two doors. There are now two possibilities. He will either think that he increases his chance of success by changing his option, or that he has an equal chance with the option he has already selected. Irrespective of his understanding or intuitions, with Door 2 no longer an option, Door 1 now holds a $2/3$ probability of success (not $1/3$ as might have been thought) to complete the selection process, as shown in Figure 5.6.

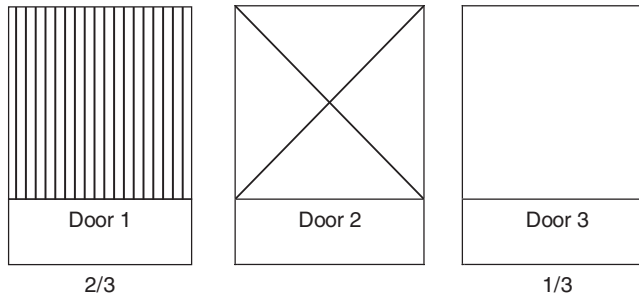

Figure 5.6. Dependency probabilities (choice)

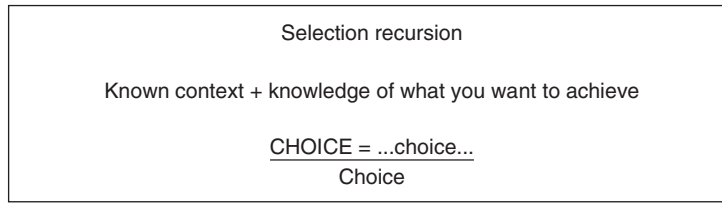

Figure 5.7. Representation of 'choice' as recursive process

There are numerous proofs of this famous cognitive illusion[10] and they are all based on the realisation that the value of any probabilistic variable should not be expressed as a value independent of its context; it depends on the knowledge we have of the environment of this variable. This feature is essential to the development of what is known as 'Bayesian statistics'.[11] I refer the reader particularly to the proof offered by Krauss and Wang (2003), since the authors relate this example to mental models and selection (reasoning) processes. The point I would like to make with this example is twofold: probabilities depend on what information is known a priori (consequently they are often intuitively incongruent), and the process of selection (choice) is recursive: it requires building up the final choice using previous choices made during the process.

The comparative notion in human language generation is no doubt far more complex, and I appreciate that the use of probabilities in this example is not the same as how they are used in systemic functional theory. However, the idea of recursively building up choice remains valid. Viewing choice as a construct that is built up recursively, it can be defined as in Figure 5.7.

[10] Try the simulator available here: <http://www.amstat.org/publications/jse/v6n3/applets/LetsMakeaDeal.html>.

[11] Special thanks to Yves Kodratoff for discussions on the nature of these probabilities.

The realised choice is built up, or constructed, recursively through the cyclic passage between the function of selecting, which is itself a very complex process, and the idealised goal. This does not say what is actually involved in shaping this process; the factors involved are like variables that will change. But within the context of producing a clause, the complexity of selection and the manipulation of choice is such that it may very well be such a recursive construction process. Like O'Donnell, I am also pursuing keystroke logging as a method of capturing language production processes, and early results are promising (Fontaine & Aldridge, forthcoming).

For an idea of how such a recursive view of choice as process interacts with choice as semantic option (simple term), the study of postmodification in the nominal group is a useful example. In Fawcett's network, this involves the THING (referent thing) network and the ad hoc description feature (among others, of course). It is important to note that what is realised by what we call a qualifier is not simply added on to a noun or an existing nominal group. You have to already know that it is going to be there before it is there. If a speaker says, for example, *I want a little house with a yard* (Fontaine, 2008), the qualifier *with a yard* is not really postmodifying *house* at all; this would imply that *house* was there in the first place to then be postmodified. The entire construction, *a little house with a yard*, has the referent <house>. This referent is represented as being involved in two situations at once; both situations are recursively constructed, simultaneously.

5.5 Concluding remarks

In summary, this chapter has presented a discussion of how choice can be disambiguated by distinguishing it with respect to two different views.

- choice(1): option. A semantic option represented in the system network as a meaning that can be meant (a simple term);
- choice(2): selection. A recursive process in the language system as the selection of semantic options (a complex function).

The interpretations of choice given here provide a possible framework for thinking about choice as process. This is not meant to suggest that this is the only way. Language is immensely complex; we cannot know all the answers. However, we should strive to define as clearly as possible the central concepts of the theory and the components of the model. Whether or not 'choice' should be replaced by 'option' and 'selection' in the literature of Systemic Functional Linguistics is a question we need to ask. What is clear from many of the chapters in this volume is that it is now time for scholars of SFL to give some attention to choice as selection, since there remain so many unanswered questions.

I hope to have shown that probabilities cannot be seen as only frequencies of occurrence. When incorporated into system thinking, they must be seen as

probabilistic variables whose values are dependent on the knowledge held of their environment. In particular, the study of referring expressions is a rich area for exploring the compounding tensions of the different systems and different strata of language. There are implications for how system networks are designed, what constitutes a choice, and what value can reasonably be assigned to features in a given system. There are strong indications here that developments are needed in terms of a contextual model, which must include a model of the speaker's understanding of the addressee, for a fuller picture of the nature of selection in language production.

6 Choice and choosing in Systemic Functional Grammar: What is it and how is it done?

Robin P. Fawcett

6.1 Purpose and scope

In Systemic Functional Linguistics (SFL), the heart of our model of language has been, since the late 1960s, the system networks of TRANSITIVITY, MOOD, THEME, LOGICAL RELATIONS and the like, but complemented by their realisations in the clause, the nominal group, etc.[1] The purpose of this chapter is to address this question:

When, as speakers and writers, we use our language(s) to create spoken and written texts (focusing here on text-sentences), how do we choose between the alternative features in these system networks?

To an outsider to the theory, it must seem extraordinary that this question was not addressed and resolved in the early years of the theory. It is true that the theory has, from its earliest days, emphasised the relationship between a text and its 'context of situation', but this cannot, on its own, explain how we choose. A small number of systemic functional linguists (or systemicists, for short) have continued to work on providing fuller answers to this question over the intervening years, and Section 6.6 will summarise the five specific proposals that have emerged from this work.

But why have so few systemicists worked on this problem?

One of the strengths of SFL is its interest in text – both as evidence for building our models of language, and because many applications of SFL involve analysing texts. But one side-effect of this is that the focus of many systemicists

[1] The ideas presented here were first developed when I was directing the COMMUNAL Project in the Computational Linguistics Unit at Cardiff University, 1987–2000. This project was supported by grants from the Speech Research Unit at DRA Malvern (later QinetiQ) for over ten years, by ICL and Longman in Phase 1; and throughout by Cardiff University. I thank all these institutions for their invaluable support for this 'blue sky' research. But I also want to express my thanks to the two friends and colleagues to whom I am most indebted. The first is Michael Halliday, the 'father' of Systemic Functional Linguistics and the linguist to whom I, like many others, owe the basic concepts of my current model of language. My second debt is to Gordon Tucker, who has worked closely with me for many years in (i) developing the version of Systemic Functional Grammar that has come to be known as the Cardiff Grammar, and (ii) in implementing it in the COMMUNAL computer model of language.

is largely on the text and its relationship to some non-linguistic factor (often a social variable), rather than on such supposedly 'theoretical' questions. Their interest in SFL descriptions of languages is, understandably, in the descriptive frameworks that SFL makes available for use in analysing texts. See Fawcett (2011) for the crucial distinction between (i) the **description** (or **model**) of a language and (ii) a **descriptive framework**, i.e. the 'appliable' simplification that is derived from the description itself and tailored for use in analysing texts, etc. In SFL, however, we consider theory, description and application to be mutually interdependent, so that every systemicist, however 'applied' their interests may be, should also be interested in the theory and description from which the descriptive frameworks are derived.

The chapter's structure is as follows.

Section 6.2 addresses the problem that, if we are to consider the process of 'choosing' in the system networks of TRANSITIVITY, MOOD, THEME, LOGICAL RELATIONS, TIME, etc. (henceforth TRANSITIVITY, MOOD, etc. for short), we need to be clear about what it is that we are choosing between.

Section 6.3 outlines an answer to our question in terms of the relationship of a text to the social situation in which it occurs, and beyond that to cultural and ideological factors.

Section 6.4 identifies a more specific source of answers to the question. This is the still relatively new field of Natural Language Generation; a field that is able, in principle, to give a far more complete range of answers.

Section 6.5 aims to 'demystify' (i) the uses in SFL of the terms *choice* and *choose* and their near-synonyms, (ii) the relationship between *choosing* and *deciding*, and (iii) the question of who or what does the 'choosing' or 'deciding'.

With the relevant senses of these terms established, Section 6.6 describes and evaluates the six specific proposals for modelling the process of choosing between features that have been made within SFL.

Finally, Section 6.7 suggests, in outline form, the sort of answer to our question that is needed, if we are to provide for the full range of reasons for choosing features in system networks – ranging from ideological and cultural factors through to the detailed unconscious planning to meet the immediate informational needs of the Addressee.

6.2 Levels of language in the Sydney and the Cardiff Grammars

Halliday's writings in the 1970s and 1980s show that he was exploring alternative approaches to modelling 'meaning' at that time. As a result, he has described the system networks for TRANSITIVITY, MOOD, etc., variously as (i) being at the level of 'meaning' and so 'semantic' (Halliday, 1970), (ii) having been 'pushed . . . fairly far . . . in the direction of the semantics' (1994a:xix),

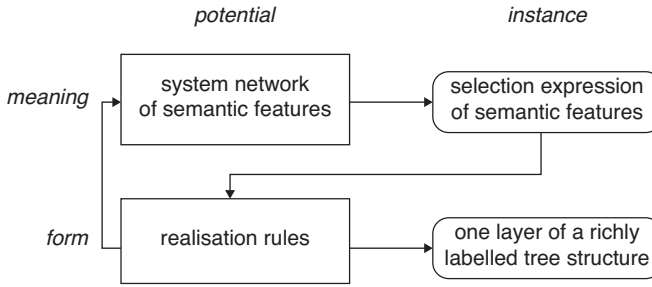

Figure 6.1. The main components of a Systemic Functional Grammar and their outputs

and (iii) as being at the level of 'wording' rather than 'meaning' – so at the level of form, as in his original 'Scale and Category' model (2002a [1961]), and as he now assumes again (e.g. Halliday & Matthiessen, 1999; 2004).

Halliday's grammar of English has changed remarkably little since the 1970s, so its formalisation as a computer model in the 1980s (as the 'Nigel Grammar') is still valid. Interestingly, the description of it in Matthiessen and Bateman (1991) shows that it operates in essentially the same way as the Cardiff Grammar. And this in turn suggests that, in practice, Halliday's system networks for TRANSITIVITY, MOOD, etc. are at (or approaching) the level of meaning, like those in the Cardiff Grammar.

Figure 6.1 presents this model of language. It is a 'grammar' – or, better, a **lexicogrammar** (since it generates lexis as well as grammar). It has two main **components** that specify 'potentials' (on the left), and two **outputs** that specify 'instances' (on the right). Thus the **system network** of semantic features specifies the language's **meaning potential**, and the **realisation rules** specify its **form potential**, their output being a syntactic unit and its elements. As Figure 6.1 shows, the **selection expression** of features chosen on a traversal of the network becomes the input to the realisation rules.

If an element of the generated unit needs to be **filled** by a further unit (e.g. a nominal group), a realisation rule (represented by the arrow on the left) specifies re-entry to the network to generate one.

The clear conclusion is that, whatever theoretical status Halliday may have assigned these system networks in his 'explorations' of alternative models (Halliday, 1973), the networks of TRANSITIVITY, MOOD, etc. are in practice essentially choices between meanings – irrespective of what further system networks may or may not be required above them.

In practical terms, then, when we ask the question 'How do we choose between the features in these networks?', we are asking essentially the same question in both versions of SFL.

However, Halliday (followed by Hasan, Martin, Matthiessen and others) has proposed that an adequate description of a language requires a higher and more abstract level of system networks: one that Martin (1992) terms 'discourse semantics' and others 'socio-semantics' or simply 'semantics'. (See Fawcett, forthcoming b, for a critique of this position.) But this doesn't radically change the picture because, even if such an additional level of system networks were to be necessary (and I argue in Fawcett, forthcoming b, that it is not), the question 'How do we choose between the features?' arises for the new level of system networks.

6.3 An answer in terms of social situation, society, culture and ideology

SFL has always given an important role to the relationship between language and the social situation in which it occurs. Indeed, the concepts of 'context of situation' and 'register variation' are there in Halliday's presentations of the early version of the theory, notably Halliday (2002a).

In recent decades, mainly inspired by Halliday's *Language as Social Semiotic* (1978b), there has been an enormous amount of insightful work in SFL that relates the social situations in which language is learnt and used, the societies that those situations reflect, and the cultural assumptions of those societies (including their ideological beliefs) to language itself – i.e. to the choices in the system networks of the lexicogrammar. Sadly, there is no space to summarise this work by Martin and his associates, by Hasan and hers, and by the many other scholars who have drawn on this rich heritage. This aspect of SFL, then, is one of its most impressive achievements.

It has the limitation, however, that the links that it makes to patterns in texts are not made through an explicit model of how that particular text comes to be produced in a particular social situation and by a particular Performer (or Performers). This isn't a disadvantage, if one's interests are specifically in the relationship between some aspect of society and the language that is typically used in a specific type of social situation. One can simply take it as read that the Performers of such texts have in their 'belief systems' certain beliefs about the type of social situation in which they are, their society and their culture.

However, if one's goal is to model the full range of choices that Performers must make in order to produce texts, we need a more comprehensive and more explicit model of language and its use.

6.4 Where else should we look for answers?

There is one field of research in which there is an ever-present need to provide answers to the question 'How do we choose?' that are principled, detailed and

fully explicit. Moreover, it is a field in which, in the 1980s and 1990s, several of today's leading figures in SFL have worked.

This is the subfield of Artificial Intelligence (which is itself a subfield of Computer Science) known as **Natural Language Generation (NLG)**. Its goal is to model the production (or 'generation') of text in a computer. O'Donnell and Bateman's (2007) survey of SFL work in NLG provides a useful background to the ideas presented here.

But perhaps you are one of the many systemicists (or one of the many inquirers into SFL) who are simply not interested in work on putting language in a computer? If so, I ask you not to abandon this chapter at this point! As one who has used SFL for both describing texts and building computer models, I assure you that it would be a great mistake to assume that the discoveries about how to model language that are made in NLG are irrelevant to improving one's general understanding of language and its use, and so to developing better descriptive frameworks for text analysis (e.g. as described in Fawcett, 2011). The genuinely interested user of a descriptive framework for analysing texts should be equally interested in the overall model that is the source of the descriptive framework.

The two major computer implementations of SFL are (i) **the Penman Project** (e.g. Mann and Matthiessen, 1985) and its later manifestation as **KPML** (e.g. Bateman, 1997), and (ii) **the COMMUNAL Project** (e.g. Fawcett, 1988; Fawcett *et al.*, 1993; Fawcett, forthcoming b). It is the concepts that have emerged from these two bodies of research that we shall examine in Section 6.6, when we consider the alternative answers that have been proposed to the question 'How do we choose?'

However, before we come to these proposals, it will be instructive to examine how we use the noun *choice* and the verb *choosing*, and so what they mean.

6.5 The meanings of *choice* and *choosing*: Does 'choosing' entail 'deciding'?

We come now to three questions concerning key ideas in SFL. They are viewed as 'difficult concepts' by some systemicists, although there is really no need for this. The first 'difficult concept' is the meaning of the term *choice* and certain near-synonyms; the second is the relationship between *choosing* and *deciding*; and the third is the question of who or what does the choosing and/or deciding.

6.5.1 Choice and choosing, selection and selecting, etc.

SFL is a theory of language that has at its heart the concept of 'choice between meanings'. But the term 'choice' brings with it two complications.

The first is the ambiguity that the word *choice* shares with many other nouns that are frequently used to denote an 'event'. When we talk of 'choice between meanings' we are using *choice* as an 'event' noun, and we could replace it by *choosing*. But *choice* is one of the many nouns in English that can denote either a 'process' or the 'product' of such a 'process', like *drawing*, *building*, *education* and *selection*. Thus we can refer to a 'process' by saying *The choice/choosing/selection/selecting of Ivy's wedding dress took all morning*.

Now consider the 'product' senses of the two terms. When we say that a system consists of two *choices*, we are using *choice* in its 'product' sense. But there is a slight problem. When we say that a system offers two choices, we mean that it has two features, each of which MIGHT be chosen – not two features that HAVE been chosen. Strictly speaking, then, a feature is only a potential 'product' until it has been chosen. In contrast, the term *selection* is typically used in SFL in the term *selection expression* (as used in Section 6.2), where it refers straightforwardly to an 'expression' that consists of the 'product' of 'selecting' features in a system network.

However, the ambiguity of *choice* between 'process' and 'product' is not the main problem with the term. The problem lies with the meaning of *choice* in its 'process' sense – and so also with the meaning of *choosing*.

6.5.2 Choosing and deciding

Consider the situation in which an experienced systemicist is trying to explain to a colleague working in another field (e.g. education) what a systemic functional grammar is and how it works. She/he may offer a description of a **system** such as

> A system is a device that has an entry condition and two or more features, one of which must be chosen if the entry condition is satisfied.

But sooner or later the inquirer is likely to ask this challenging question:

> Are you claiming that this process of choosing features in systems corresponds to the psychological reality of how we decide what we are going to say or write?

This is a reasonable question, given that Halliday himself has written in this vein at times, e.g. when he says (1970:142):

> In speaking, we choose: whether to make a statement or to ask a question, whether to generalize or particularize . . . and so on.

So how does our experienced systemicist reply to the question about the 'psychological reality' of choice in a system network? A typical reply would be something like this:

We make no such claim! Describing the core of the grammar as a system network of 'choices between meanings' is simply a convenient way of conceptualising the paradigmatic relationships between meanings that the language makes available to us. There is certainly no claim that a person who is producing a text is actually deciding between such choices.

I too have given answers like this in the past. But these days I would not want to leave the matter there. We should ask why systemicists are so quick to deny that speakers of a language use its system networks of choices between meanings when planning a text-sentence – and, if they don't use system networks, where the decisions are made. But first I shall give four reasons for rejecting the claim.

First, we don't want to be thought to hold the naive belief that a human mind operates with a mental picture of lines and named features.

Nor do we wish to make the impossibly strong claim that our system networks and realisation rules correspond to the neural networks of the human brain.

Third, we don't want to be thought to be implying that such planning decisions are made consciously (though occasionally they may be). Such planning is agreed to be almost entirely unconscious.

The fourth reason is rather different. It is that all systemicists who have worked on using Systemic Functional Grammar to generate text-sentences in computers (including myself) have moved on from the initially attractive belief that the **system networks** constitute a **decision tree** for planning text-sentences. (For the reasons, see Section 6.6.)

Yet this was the position of those working on the two projects that have implemented large-scale SFL models in NLG – at the start of those projects. At that early stage, then, we all thought it would be possible that system networks could be used to model the planning decisions of someone producing a text. The two projects were (i) the Penman Project, which began in the early 1980s and is described most fully in Matthiessen and Bateman (1991), and (ii) The COMMUNAL Project, which began in 1987 and is described in Fawcett *et al*. (1993) and many other papers, and most fully in Fawcett (forthcoming b). In Sections 6.6 and 6.7 we shall examine (i) the initial positions that the two projects adopted, and (ii) the alternative positions that they explored and developed later.

What, then, is the relationship between 'choosing' and 'deciding'? Can the dictionary help us? The *COBUILD English Dictionary* (Sinclair, 1995) tells us that "if you choose . . . something, you decide which . . . thing you want to have". In other words, if you 'choose' something, you 'decide that you want to have' it – and, we might add, 'choosing' something typically results in having it. So *choosing* (like many lexical verbs) is a complex process, involving not only 'deciding' but also 'wanting' and 'coming to have'. Or, simplifying only slightly, 'choosing something' implies 'deciding to have something'.

Let me summarise so far: (i) 'choosing' entails 'deciding', but (ii) those working on modelling such matters no longer think that the system networks are the mechanism for deciding.

But there is one further twist. We have to face the fact that systemicists will probably continue to describe SFL as a theory of language that is based on the concept of 'choice between meanings in system networks'. These words are so deeply embedded in the SFL psyche, as it were, that we have to find them a place in the theory.

We must conclude, therefore, that the words *choice* and *choosing* are used in two different senses in SFL. These are:

(i) the everyday sense of *choice* and *choosing* in which 'choosing' means 'deciding to have', and

(ii) a symbolic sense, internal to SFL, in which we say that there is a 'choice' between the features in a system, even though we now think that the decision to choose a feature almost always occurs at an earlier stage in the process of generation.

The result is that, when we are talking about the process of producing or generating text-sentences (whether by a human being or by a computer model) the expressions *choosing* and *deciding (to have)* are virtually interchangeable – but there is no implication that the decision is made in the place where the alternatives are modelled.

However, the terms *choice* and *choosing* are also used, within SFL, to evoke the theory's core concept of 'choice between features in a system'. But in this case they cannot be replaced by *deciding to have*, because the decisions are made elsewhere. (The question of where that might be is addressed in Section 6.6.)

We come now to the third 'difficult concept', after which we shall be ready to consider the alternative proposals.

6.5.3 Who or what decides (and so in effect chooses)?

The third of the three 'difficult concepts' is that of who or what 'decides'. In an analysis of the transitivity of 'choosing' using the Cardiff Grammar procedure, the tests for Participant Roles (PRs) show that, in the 'cognition' Process of 'choosing', the PRs are an Agent-Cognisant and a Phenomenon – just as they are for 'deciding', 'selecting' and 'opting for'. And a typical Agent-Cognisant is a human being. (For the methodology for deciding, see Neale, 2002, and Fawcett, 2011.) So the commonsense answer is that the 'decider' is the referent of the Agent-Cognisant – or perhaps the planning component in that person's mind, or, in the field of Natural Language Generation, a computer model of this.

But many systemicists have a problem with this approach, and it affects the way they think about language and its use. It has even affected the way in which

the systemic functional grammar is seen as operating in the Penman model of text generation (which grew into a major contribution to NLG). Penman will be described more fully in Section 6.6.3, and here we shall focus on the language used to describe it. Consider this passage:

> The basic question is: 'Given a communicative purpose (goal) in a natural context, how does the system of linguistic processes and resources work to produce a text?' (Matthiessen, 1988:221)

Here, Matthiessen seems to be suggesting that, 'in a natural context', the decisions are not taken by a planning component in the Performer's mind, as we might expect, but by 'the system of linguistic processes and resources'. But how, we might ask, can this 'system' (in the general sense) carry out the 'work' of choosing features in the network, given that the network is itself the core of 'the system of linguistic processes and resources'? Is Matthiessen suggesting that the 'linguistic processes' themselves can make the decisions? If so, the claim would need to be clarified and justified. Rather similarly, if the generated text is to serve a 'communicative purpose', we may reasonably ask 'Whose communicative purpose is it?' But we are not told.

Another sign of what appears to be an attempt to avoid 'cognitive' terminology is the regular use of the term 'environment'. It was first introduced in Mann and Matthiessen (1985) to refer to almost everything in the model, it seems, that is NOT either (i) the language itself or (ii) the chooser and inquiry framework (the subject of Section 6.6.3).

Despite the fact that they were working in the field of NLG, then, Mann and Matthiessen frequently went out of their way to avoid using the accepted concepts and terminology of the field, simply replacing most of them by the over-general concept of 'the environment'.

And the same set of concepts can be found in other descriptions of the Penman Project that were written in this period. The question is: 'Why should they write in this way?'

In trying to understand why they adopted this position, we need to take into account a number of factors. The primary factor was that, in the period in the 1980s when Matthiessen was working with Mann on the Penman Project, Halliday was the team's 'grammar consultant'. So the whole project was set within the overall framework of the strongly socially oriented architecture for language established by Halliday in the 1970s. But why should this effect have been so powerful?

The main reason is Halliday's position as the major architect of SFL, and so his influence on the overall architecture of Penman. And Halliday's emphasis on modelling language in its social setting, which he inherited from J. R. Firth, has only grown stronger with time. Another possible factor was that this was a period in the history of linguistics when the Chomskyan paradigm, with

its claim to be 'a window into the mind', was at the height of its forbidding dominance – coupled with the incompatibility between the goals that Chomsky set for linguistics and those set by Halliday. It seems likely that some such combination of factors led Halliday to adopt a 'horses for courses' approach (as most explicitly stated in Halliday, 1964), with the result that Halliday and his colleagues systematically avoided making overt claims about any aspect of language that seemed to be 'cognitive' (and so to belong in Chomskyan territory), focusing instead on the 'social' aspects of language. The result was that, when Halliday became involved in NLG, the writings of Mann and Matthiessen reflected Halliday's reluctance to engage with the explicitly 'cognitive' aspects of language. But the drawback of adopting this position was that it led to the need to establish alternative ways of referring to any 'cognitive' concept, such as 'the environment'.[2]

Interestingly, however, Mann and Matthiessen's descriptions do at times introduce concepts that reflect the influence of NLG. Thus Matthiessen (1988) writes:

> Among other things, the system contains a KNOWLEDGE BASE representing the speaker's (i.e. the system's) DOMAIN / field of context . . . and a detailed TEXT PLAN. [my emphases]

The highlighted words are all taken from the field of NLG, and his use of 'text plan' clearly implies something or someone that plans a text, which in turn implies that we are in the area of modelling what I have called 'a communicating mind' (Fawcett, 1980).

There was another indication in Matthiessen (1988) that he acknowledged that work in NLG requires a model of a communicating mind. This was where he points out the similarity of function between his **chooser and inquiry framework** and the **procedural felicity conditions** of my explicitly 'cognitive-interactive' framework for generation, as described in Fawcett (1980). As Matthiessen rightly says (1988:222), 'the [chooser and inquiry] framework addresses part of the task Robin Fawcett specifies for the problem solver in his model of communication', i.e. the use of 'procedural felicity conditions' to 'help in the selection of actual semantic features'.

To summarise: it is clear that, in a **computer implementation** of the human process of generating a text, there must be some kind of **planning component** that makes the decisions. The planning cannot be carried out by the grammar itself, as implied in the words from Matthiessen (1988) cited earlier – and

[2] It is a fascinating paradox that some of Halliday's most valuable contributions to the description of English have been in two areas of meaning in which it is virtually impossible to describe how those features in the system network come to be chosen without referring to what is in the minds of the Performer and the Addressee – i.e. the 'thematic' and the 'informational' strands of meaning that comprise what Halliday terms the 'textual' component of the grammar.

as is also implied by other systemicists when they use wordings such as 'the grammar chooses between . . . '. In reality, a grammar can neither 'decide' nor 'choose', and to suggest that it can is to perpetuate an attractive but misleading personification of a grammar. In practical terms, the only type of entity that can make such decisions is someone or something that has the ability to consider alternatives, to weigh the evidence for each, to decide between them, and to implement those decisions.

In principle, this decision-making could take place either (i) during a traversal of the system network for TRANSITIVITY, MOOD, etc., or (ii) in a higher component which then causes the appropriate choices to be made in the system networks for TRANSITIVITY, MOOD, etc.

Moreover, if that is true for a computer model of how we generate text-sentences, it is reasonable to assume that it is also true – in broad, functional terms – of what happens in our heads when we use language. In other words, this is an area where systemicists can usefully import some commonsense ideas from a sister field of research in which SFGs have been widely and successfully used, i.e. NLG. While 'commonsense' ideas should always be examined carefully – because they are often wrong – they are also often right.

6.5.4 Summary

Let me summarise Section 6.5. First, we need to distinguish two senses within the 'process' sense of *choice*: the general sense in which 'choosing' implies 'deciding', and its 'mantra' use within SFL where it does not. So 'choosing' clearly entails 'deciding'. Nor is there any serious doubt about who or what makes the decisions. The supposed 'difficulty' of these concepts arises when one adopts a 'socio-cultural' viewpoint that seeks to exclude the use of terms that are derived from the idea that a text is the product of a communicating mind, and so needs to be set in a cognitive-interactive framework – while providing for socio-cultural beliefs (see Section 6.7). The difficulty arises, then, from an attempt to avoid the unavoidable: i.e. the fact that a Performer of a text is continually making planning decisions about what to say and how to say it, with both her/his and the Addressee's goals and the informational needs of the Addressee constantly in mind.

The more 'difficult' questions are those addressed in Section 6.6.

6.6 Five specific proposals for modelling how we choose

6.6.1 The key questions

If our goal is to model how we 'choose' between the features in a system network, the questions that we need to address are these:

1. At what stage (or stages) in the process of generation are the decisions that lead to the choice of a feature in a system network taken?
2. What formalism best represents the components in which the decisions are made?
3. By what means are those decisions made? and
4. By what means do they come to affect the 'choices' in the system networks?

Sections 6.6 and 6.7 will describe and evaluate the five answers to these questions proposed so far by SFL scholars.

The answer to the first of these questions given by systemicists working on NLG in computers in the 1980s was 'in the system network'. Indeed, it was the similarity of the structure of a **system network** to that of a **decision tree** that first attracted the attention of computer scientists working in NLG to SFL. In the words of Reiter and Dale, the authors of the standard introduction to NLG (2000:175):

> In Systemic Functional Grammar (as in many aspects of NLG) the central notion is one of choosing between available alternatives.

Section 6.6.6 will show whether that assumption was justified.

6.6.2 *Procedural felicity conditions: a first attempt at modelling how we choose*

It was in the early 1970s that I began exploring ways to answer the question 'How do we choose?' (Fawcett, 1981 [1973]). Then, in Fawcett (1980), I presented a rather fuller picture of how a SFG might function in 'an integrated model of a Systemic Functional Grammar and the other components of a communicating mind' (to quote that book's subtitle). Without fully realising it, I was exploring the idea that a system network could simultaneously (i) specify the **meaning potential** that determines what can be realised in linguistic forms and (ii) function as a **decision tree**. The key notion was that each semantic feature was, in effect, A SUMMARY OF THE CONDITIONS THAT HAD TO BE MET for that feature to be selected.

In other words, I formulated the relationship between the feature in the system and the predetermining data in the higher component (which I was then calling the 'knowledge of the universe') in terms of **procedural felicity conditions**. I was using 'felicity conditions' in a sense that is fairly similar to that of Searle (e.g. 1969), except that (i) they could be applied to all types of meaning, and (ii) they were to be used as 'procedural' tests. I wrote:

> These conditions [for selecting a given semantic feature in the system network] are what link the systemically related meanings shown in the network to the various aspects of the knowledge [of the universe]. (Fawcett, 1980:125)

Thus the felicity conditions for choosing a feature were expressed passively, i.e. as conditions that had to be satisfied before a given feature could be selected, rather than as active 'consultations' that were performed by a **planner** (as in our later model). The key point was that the model pointed to the crucial connection between the features in the network and specific parts of the 'knowledge of the universe'. Furthermore, the overall model included a **problem solver** (i.e. a **planner)** (Fawcett, 1980:58), whose task was to supervise the process of generation (though I didn't specify how that was to be done).

But this question then arises: 'What sequence should be followed when checking whether the conditions for a feature are satisfied?' The obvious answer, we assumed, was the sequence dictated by the network, starting with the less delicate choices and working through to the more delicate ones. Notice, however, that in doing this we would be using the system network as a **decision tree**.

It was this model, then, that provided the initial framework for the COMMUNAL Project in NLG when we began work at Cardiff University in 1987, and the first two versions contained many such 'procedural felicity conditions'.

6.6.3 Penman's chooser and inquiry framework

Matthiessen (1988) presents Penman as consisting of (i) the **lexicogrammar**, with above it (ii) the **chooser and inquiry** framework, and above that (iii) the **environment**. The environment includes components that in other NLG models would be presented as major components or inputs in their own right, i.e. (i) a **text plan**, which is the input to the generator (and which logically presupposes (ii) a **text planner**, though this is not mentioned) and (iii) a **knowledge base**.

Here we shall focus on the chooser and inquiry framework, and how it operates. Above each **system** there is a little **decision tree**, called a **chooser**, which has as many branches as are necessary to obtain the information that is required to decide between the features in the system. At each 'choice point' in the system network the chooser puts a small set of **inquiries** to 'the environment' (its database) and the environment's response determines whether or not that path will be taken.

The advantage that this framework has over procedural felicity conditions is that a chooser can have as many branches as it needs (rather than having just one felicity condition per feature), so enabling it to consult more than one source of data in the knowledge base.

But it has one enormous limitation. This is that the overall structure of the **decision tree** is provided by the **system network**. Whenever, as the planner works its way across the system network, it reaches a new **system**, it steps up a level to use the **chooser** that sits above it to decide which feature to choose. Then, after choosing, it steps back down to the level of the network

and moves on to the next system – and so on, until all possible pathways through the network have been exhausted. So each chooser is only related to its neighbouring choosers VIA THE SYSTEM NETWORK, and it is the network that determines the overall sequence in which the choosers put their inquiries to the database – just as it was with procedural felicity conditions.

6.6.4 A crucial conceptual breakthrough: towards a 'macro-chooser'

However, while the Penman group were implementing the chooser and inquiry framework, they were already exploring a radical extension to the concept.

This new concept first appeared in Bateman's description of his work on modelling 'politeness' in Japanese (Bateman, 1986), but Matthiessen (1988:233) was clearly considering the same concept when he suggested that "there is reason to believe that an [overall] explicit inquiry network would be quite useful".

Matthiessen and Bateman (1991:178–180) identify the key characteristic of the new proposal as being that "it no longer needs to be held in a one-to-one correspondence with . . . the systems of the grammar network", with the result that

> the inquiries of this decision tree [for politeness] are free to ask all the questions related to the aspects of the social relationships of the participants in the speech situation WITHOUT BEING CONCERNED ABOUT WHERE IN THE GRAMMATICAL NETWORK THE CONSEQUENCES OF [THE ANSWERS TO] THESE QUESTIONS WILL BE FELT. [my emphasis]

They do not give this new concept a name, so we shall refer to it here as a 'macro-chooser' (for obvious reasons). In principle, then, the model could have a set of macro-choosers, with one for each major area of meaning (such as Bateman's for 'politeness' in Japanese) or one macro-chooser for all of language, as Matthiessen was considering in his (1988) paper. And, interestingly, a similar proposal was being developed and implemented independently in COMMUNAL in the late 1980s, as a replacement for the failed concept of procedural felicity conditions (see Section 6.6.7 for this).

However, the fact is that this promising new concept was never implemented in Penman (possibly because of research funding deadlines), despite Matthiessen and Bateman's (1991:178) judgement that "it is clear . . . that the Nigel chooser tree organization of inquiries is problematic". Instead, the chooser and inquiry framework became an established part of the Penman architecture, and it is still in use (Bateman, personal communication, 2005).

6.6.5 Theory and practice in later developments in Penman and KPML

The next new idea was discussed by Bateman in the documentation of the KPML Project, but it remained unimplemented. It had two stages: (i) to extend

the concept of the chooser to the point where it would constitute a complete framework of inquiries that covered the whole system network (so a 'macro-chooser', as discussed in Section 6.6.4), then (ii) to reinterpret the resulting vast decision tree as a new level of **semantic system networks**. These would be at the same level as Martin's (1992) 'discourse semantics' and Halliday and Matthiessen's (1999) higher 'semantics'.

Notice that the second half of Bateman's proposal entails dismissing Matthiessen's (1988:235) argument that the inquiries in such choosers are decision trees (and not system networks) – a position on which Matthiessen would change his mind by 1999). Yet in Matthiessen and Bateman (1991:179) the authors were still emphasising that their proposal was for a decision tree and not a system network. Nonetheless, this higher semantic system network is the fourth possible answer to 'How do we choose?'

The second 'development' was the absence of development. In other words, Bateman's KPML (the successor to Penman) continued to use the original chooser and inquiry framework. (For descriptions of KPML, see Bateman, 1990, 1991, 1997.)

6.6.6 The 'Upper Model': ontology or semantic system network?

However, there was one new idea that did get implemented, in both Penman and KPML. This was the **Upper Model**. In Bateman's (1990:56) words:

> the Upper Model represents the speaker's experience in terms of generalized linguistically-motivated 'ontological' categories.

So it is an **ontology**, i.e. 'a general organisation of knowledge' as a taxonomy, such that it can be used as an 'inheritance hierarchy' in reasoning. As a key component of the knowledge base in KPML, it has been widely used in systems that require a NLG component (see Fawcett, 1994, for an evaluation of this and other ontologies.) Indeed, it has a clear equivalent in the **ontology** in the COMMUNAL **belief system**.

Interestingly, Halliday and Matthiessen (1999:11) suggest that the KPML Upper Model is equivalent to their higher **semantic system network**, i.e. that it models "the ideational semantic resources [that] construe our experience of the world that is around and inside us".

But the Upper Model plays a crucially different role in KPML from the role of Halliday and Matthiessen's semantic system network. The Upper Model's role is to be an ontology that is consulted by the chooser and inquiry framework, in the same way that the inquiries consult the 'text base/plan and the interaction base/dialogue model'. So it is one of several resources that can be consulted and, like other types of 'knowledge', it would, in the Cardiff Model, be part of the **belief system**. Yet in Halliday and Matthiessen (1999), as also in Halliday

and Matthiessen (2004), the suggestion is that the Upper Model is equivalent to the experiential part of a **semantic system network**.

To summarise: an **ontology** is a different concept from a **system network** (just as a **decision tree** is), and in practice the Upper Model is part of the database in the chooser and inquiry framework.

It will be interesting to see which of the two views of the Upper Model prevails in the long run. Or perhaps those developing the Sydney Model will return to the earlier idea of having one or more macro-choosers – so possibly a set of **microplanners**, as described in Section 6.6.7.

6.6.7 The equivalent developments in COMMUNAL: microplanners and the belief system

Finally, we turn to the developments in COMMUNAL that followed our rejection of procedural felicity conditions for guiding choice between features in system networks.

Our first step was to establish a revised set of research principles, including these two:

> Think about each problem in terms of the FULL SET OF COMPONENTS that is required in a complete generation system, and so avoid the danger of trying to make any one component do more than one type of work.
>
> Describe the internal structure of each of the higher components IN WHATEVER TERMS ARE MOST APPROPRIATE TO IT (so do not assume that each will have the form of a system network).

In other words, we allowed the theoretical model to grow out of the requirement to find the concepts that would enable us to model, with appropriate complexity, the function served by each component. It was this approach that led us to adopt the concept of a **decision tree** for the **microplanners** – via a process of considering alternatives, testing and evaluating them, refining or rejecting them, and then repeating the process.

Section 6.7 will outline the main components of the overall architecture that we consider to be needed in a full model of language and its use. This will show the central place in generation given to the dozen or so microplanners that we think are required for generating text, and we shall therefore delay our description of how they decide choices in the system network until then.

6.6.8 Summary so far

After the failure of the concept of **procedural felicity conditions** in COMMUNAL and Matthiessen and Bateman's (1991) criticisms of the **chooser and inquiry framework** in Penman, the concept of **decision trees** that

'consult' the Performer's **belief system** (aka 'the environment') became the favoured solution to the problem of modelling how we choose. This was true of researchers working on both Penman (where I have suggested that the concept could be termed a 'macro-chooser') and COMMUNAL (where we call them **microplanners**). But a series of factors have combined to prevent this promising concept from being implemented in the Penman–KPML model, including (i) the influence of the Halliday–Matthiessen proposal for a higher level of **semantic system networks** that would **predetermine** choices in TRANSITIVITY, MOOD, etc., (ii) the unclear status of the **Upper Model**, and (iii) extraneous factors such as career moves and changing research interests. Since the alternative proposal of a higher semantics has not been implemented either, the chooser and inquiry framework is still the only computer-implemented model for choosing in the Sydney Model – despite Matthiessen's and Bateman's recognition of its limitations. But it has the virtue of being available to users, and Reiter and Dale (2000:171) praise it as "a complex and powerful system".

In the Cardiff Model, in contrast, we have computer implementations of the **microplanners** for several very large areas of meaning. These include generating appropriate referring expressions, selecting various types of theme, modelling time and aspectual type, and expressing degrees of validity. But we have lacked the resources of time, personnel and financial support to complete the development and testing of (i) the very large third-generation generative lexicogrammar, and (ii) the many remaining components that are needed to make the full model viable.

6.7 Conclusions: the need for an integrative model

A full model of language and its use must be an integrative model. In other words, it must provide appropriate subcomponents for all of the many types of belief that may influence the decisions that lead to a given text, from the broadest ideological beliefs to the most detailed adjustments to the Addressee's current informational needs. It will include these four major components:

1. a **generation** macro-component;
2. an **understanding** macro-component;
3. the vast **component** that is consulted at the various decision-making stages of generation and understanding, i.e. the **belief system** (aka 'the environment' or 'the database'), and;
4. a general **planner and reasoner**, which initiates the procedures for generation and understanding and then guides their decisions.

See Figure 6.2 for an overview of the COMMUNAL version of this general model (taken from Fawcett, forthcoming b).

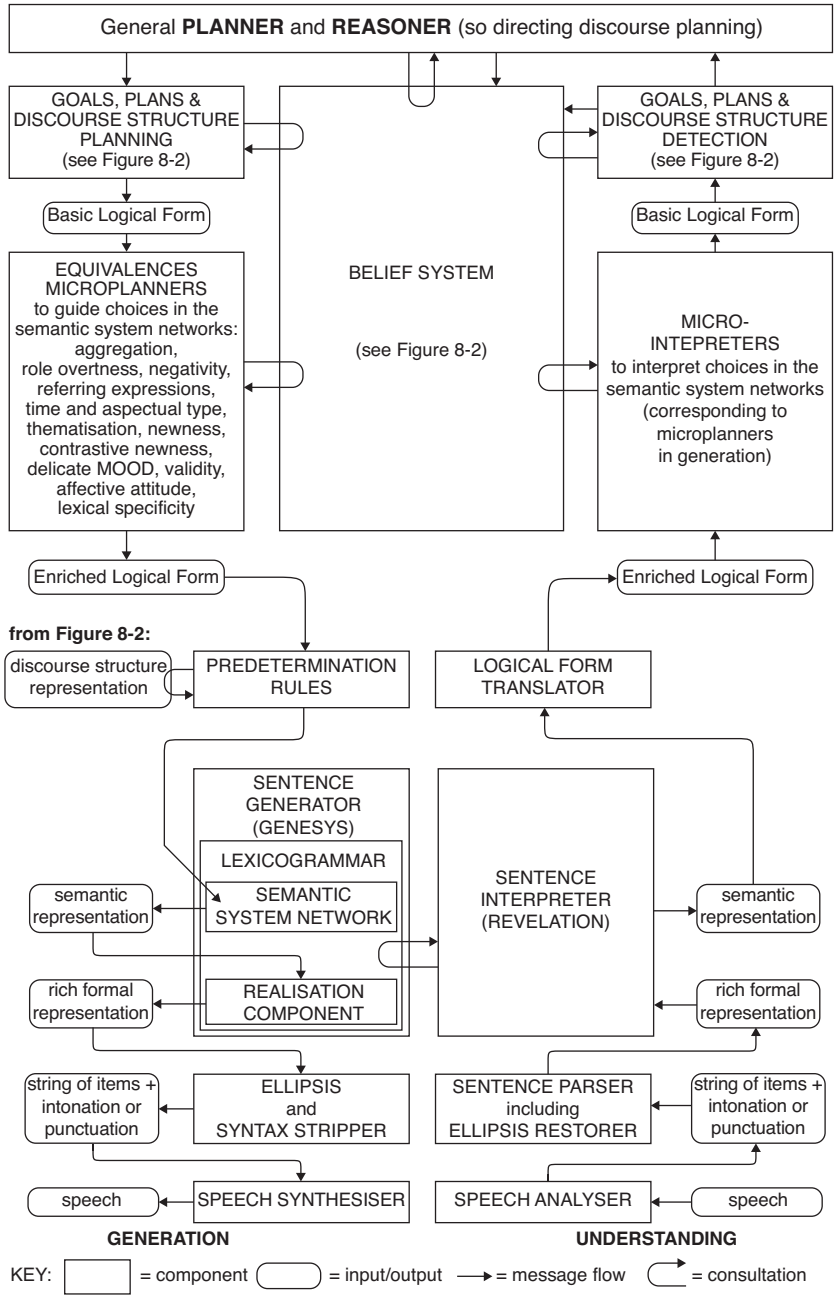

Figure 6.2. The major components of a communicating mind

We shall now focus on **generation** in Figure 6.2. i.e. the left side of the diagram. Within generation, there are several stages and so several components. One group of components generates **discourse structure** (genre, exchange and rhetorical structure), and another **text-sentences**. And within the latter the major components are the **microplanners**, the **belief system** that they consult, the **semantic system networks** and the **realisation rules** that specify the output at the level of form. Note too the provision for the **inputs** to and **outputs** from each 'processing' component.

Now let us consider the role of the **microplanners** and so the belief system. The initial input to generation is a representation of an **event**, using a specially developed logical form called **systemic functional logical form** (SFLF). SFLF is also used for the inputs to and outputs from each of the dozen or so microplanners, and for representing the beliefs in the belief system.

Each microplanner is a decision tree (expressed as a **flow chart**) that covers a major area of meaning, e.g. the complex decisions that result in the generation of the various types of **Theme**. At each decision point the **planner** consults the relevant aspects of the **belief system** (which includes an **ontology**, as well as beliefs about **individual persons**, **societies** and **cultures**), and then determines a preference for one type of Theme, marking it by an addition to the logical form. This **enriched logical form (ELF)** then becomes the input to the next microplanner, which enriches it further, and so on, until the final, multiply enriched ELF is produced. This contains all the information needed to identify the corresponding 'choices' in the **semantic system networks**, and the **predetermination rules** automatically convert each element of the ELF into a preference for the relevant features. Finally, the **realisation rules** convert the selection expressions of semantic features into functional syntax, items and intonation or punctuation.

It is the microplanners, therefore, that make the crucial decisions about 'choice' between features in systems – not the system networks.

Fawcett (forthcoming b) provides a far fuller description of the entire architecture and how it works. It includes a second complex figure (referred to in Figure 6.2 as Figure 8–2), which provides details of (i) the early stages of planning and (ii) the many subcomponents of the belief system (aka 'knowledge'), including beliefs about the current social situation type, the preceding text, relevant cultural and ideological matters, etc., and also beliefs about what the Addressee believes about these matters.

This brief description summarises the answer given in the Cardiff Model to our initial question of 'How do we choose the features in the system networks?' Our answer is: 'In the decision trees of the microplanners, after consulting the belief system. The further stages that lead to choosing features in system networks follow automatically.'

Much work remains to be done before every component of this complex model is available for implementation in a computer. Note, however, that this does not detract from its value as a descriptive model. Few models of language processing reach the stage of being available to the public in computational form, but there is no reason why, with the help of other scholars, we should not complete the construction of this advanced model and make it publicly available as a 'next generation' of text generator and text understander.

For a much fuller picture of what has been achieved so far, please see Fawcett (forthcoming b).

Part II

Cognitive and Neurolinguistic Views on Choice

7 Systemic networks, relational networks and choice

Sydney Lamb

Relational networks (RN) have a special relationship to systemic functional networks (SN), arising from the fact that the RN notation in its original form was developed (in 1964) under the influence of systemic network notation. The two types of network thus have a strong superficial resemblance. This chapter examines the relationships between the two notations and, in particular, the nature of choice as portrayed in SN, viewed from the perspective of RN. The promise of such exploration is enhanced by the hypothesis that relational networks are related in a rather direct way to actual brain structures. Since they are also related to systemic networks, they provide a bridge from the latter to the brain. But the notation of relational networks shows more detail, and it can be expanded into a 'narrow' form of notation that allows for still more detail and is thus closer to the actual neural structures. In this narrow form of notation we can make explicit an essential property of the nature of choice: an important part of the significance of a choice is its contrast to what could have been chosen instead.

While they bear a resemblance to systemic networks, relational networks have important structural differences, in keeping with their somewhat different aim. They are intended for describing the linguistic system of a language user. Systemic networks, on the other hand, are (in my understanding) intended primarily for elucidating the structures of texts by showing how every feature of a text is the result of some choice made by its constructor. This aim (without question, a worthy one) requires that the range of available alternatives also be shown; and so the result is a network of choices. In my interpretation, the chief value of the depiction of such choices lies in the assistance they provide in understanding the structure of texts. Part of the job of this chapter is to explore the relationship between such networks of choices, on the one hand, and the linguistic system of the language user, on the other.

The system of the language user, clearly a different object from the text or the set of possible texts, is what generates texts; it also operates upon texts received from others (or from oneself). Such operation is sometimes called comprehension or understanding or parsing, but none of these terms is quite accurate. One who hears texts comprehends to some extent but only rarely

gets exactly the same meaning as that intended by the speaker, and different receivers usually get different messages to a greater or lesser extent. The system is also dynamic: it changes continually just as a consequence of its operation in generating and receiving texts.

7.1 The origins of RN

The attempt to figure out the nature of the linguistic system was a major preoccupation of the structural linguistics being practised in America in the mid twentieth century. Among the several problems needing solution for a successful completion of this quest, one was commonly left unrecognised: that of defining the object of investigation, the linguistic system. The view espoused in this chapter, that the linguistic system is a cognitive system of the language user, was not generally adopted, and in fact the need to define just what kind of system was the object of the quest was not even generally recognised. Nevertheless, by the 1960s it was becoming apparent to a few investigators, including Gleason (1964), Hockett (1961) and me, that relationships loom large. And Louis Hjelmslev of Copenhagen had written his *Prolegomena to a Theory of Language* (1961) in which he declared (but did not demonstrate) that a language consists of nothing but relationships. At that time the linguistic system was viewed by me and like-minded investigators as containing items (of unspecified nature) together with their interrelationships (cf. Hockett's 'Linguistic Elements and their Relations', 1961). The primitive notations I was using at that time used lines to connect related units, represented in alphabetic symbols (see, for example, Lamb, 1964). What was needed as a next step was nodes to go along with such connecting lines. Halliday's notation (which I first saw in 1964) used different nodes for disjunctive ('or') and conjunctive ('and') relationships, just what I was looking for. And so I made some simple adaptations and the result was relational network notation.

The derivation of RN from SN consisted of three simple adaptations (Figure 7.1):

1. A clockwise rotation of 90 degrees. This allowed the upward direction to be towards meaning or function, while downwards was towards phonetics (or graphic expression);
2. Replacement of the brace for 'and' with a (more node-like appearing) triangle;
3. The multiple lines of the 'or' node (representing choices) were connected to the node at a point in the simple case, or at different points for ordered relations (see below).

As with systemic network diagrams, we used both node types in both directions, which could be called 'upward' and 'downward' in the case of relational networks, with their 90-degree rotation (Figure 7.1).

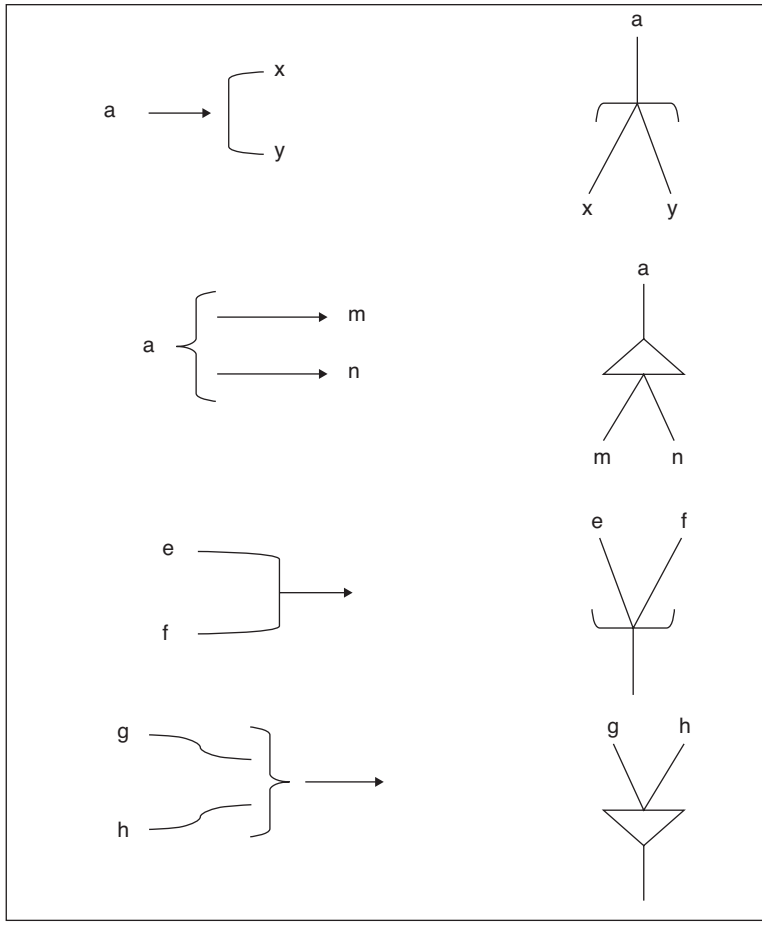

Figure 7.1. SN nodes translated into RN nodes

The nodes of RN are either ordered or unordered, as shown by whether multiple lines connecting to one side of the node connect at one point or different points. In the case of the 'and' relationship, ordering is sequential, so the 'ordered AND' had its two (or more) lines connected to different points at the bottom of the triangle, ordered from left to right, for sequential activation, leading to sequential occurrence of items, needed because linguistic items like words occur in a temporal sequence (Figure 7.2). For the 'or' relation, we clearly don't have sequence, since only one of the two (or more) lines is chosen. But an ordering feature for this node is needed to indicate precedence. So we have 'precedence ordering'. This notational device allows us to indicate

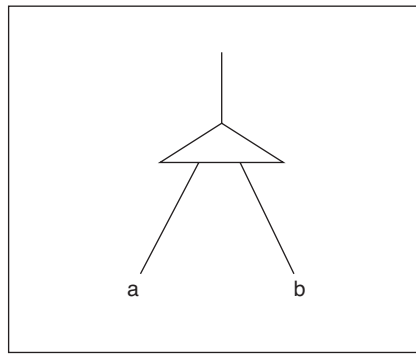

Figure 7.2. The ordered AND: first a, then b

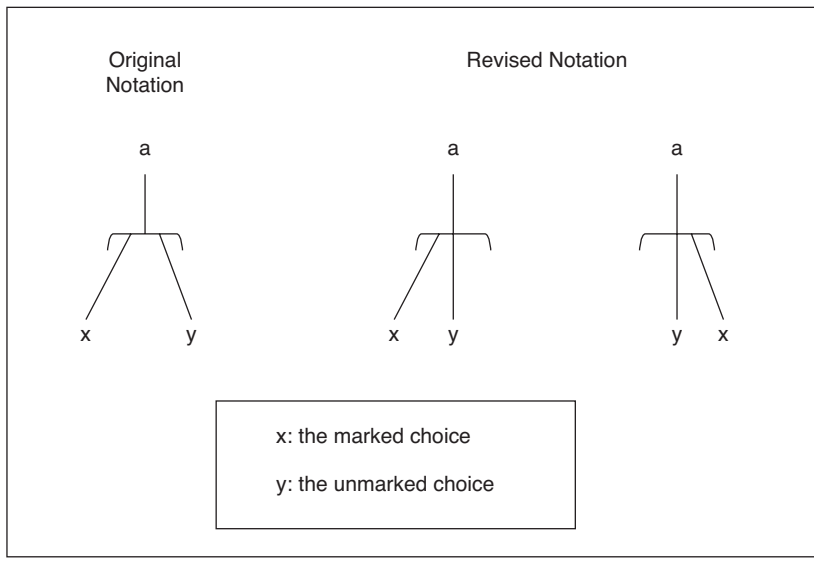

Figure 7.3. Ordered OR nodes

the difference between marked and unmarked choices. In the original version of RN notation, the line taking precedence was always connected at the left, meaning that if conditions allow for its activation to be realised, it will be chosen in preference to the other line. The marked choice takes precedence in that it is chosen if the conditions that constitute the marking are present (see Figure 7.3).

In the later version of RN notation, the line for the default choice is the one that goes straight through the node, and the marked option is indicated by a line that is off to the side – either side (Figure 2). This notational modification

allows for greater flexibility in diagramming for the sake of aesthetics and readability.

After making these adaptations to systemic network notation, resulting in relational network notation, it became apparent (to me, one afternoon in the fall of 1964) that relational networks need not contain any items at all. Consider, for example, the status of the morpheme *boy*. It usually has been thought of (and in fact still is after all these years) as an object of some kind. But we may ask, 'Of what kind?' Is it a symbolic object? If so it would have to be a symbol or a combination of symbols (perhaps of the symbols *b o y*). So we may ask, 'What kind of symbol?' Is it a written symbol? Hardly seems likely, as children speak long before they are able to write. Anyway, the brain does not contain within itself little pencils or other writing instruments and little pieces of paper or other surfaces on which to write. The same argument, *mutatis mutandis*, can be made for any other means of representing symbols. In short, symbols are *outside* the brain, not within it.

7.2 RN as purely relational

It became clear that as soon as the relationships defining this object have been fully specified, as they can be with the aid of relational network notation, then the item itself, as an item, simply disappears (Figure 7.4). For this item, depicted symbolically in the left-hand version of Figure 7.4, adds no information to what is already represented in the right-hand version. In other words, we can convert from the left-hand version to the right-hand version **with no loss of information**. Readers who may find this difficult to accept should ask themselves, 'What additional information is present in the left-hand side of Figure 7.4 that is not present in the right-hand side?'

Now if we turn our attention to the symbols at the bottom of the figure – b o y – their relationships to phonological features can also be specified and so they can be seen to 'disappear' in the same way. And we can (in principle) perform the corresponding operations for the concept BOY and the syntactic category Noun – though, admittedly, it is not easy to specify the details of conceptual relationships. Yet even though it is not easy (and in fact a fully detailed account is impossible in practice), those details are nonetheless all relational. For BOY there are connections to concepts representing HUMAN and MALE and NON-ADULT, and to various associations and idioms like *bellboy*, *batboy*, *busboy* and whatever other information a person has about boys – no matter how much, it is all relational. This argument is presented in greater detail in *Pathways of the Brain* (hereinafter *Pathways*) (Lamb, 1999:51–62).

By this line of reasoning it becomes clear that as soon as the relationships defining *any* linguistic object are fully specified, then the item itself does not really have existence as an object. And this conclusion is supported by other arguments. If linguistic objects are represented symbolically within the mind

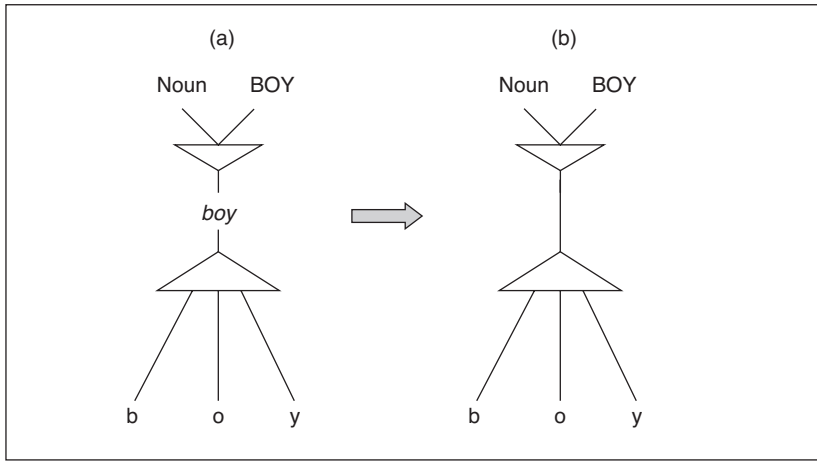

Figure 7.4. Removing the morpheme symbol with no loss of information. ('Noun' represents whatever grammatical category information the system has about this item – the same in both (a) and (b). 'BOY' represents whatever semantic/conceptual information the system has. These are symbols only in the diagram, not in the linguistic system – in the system they are sets of interconnected relationships; likewise, the phonological symbols at the bottom of the figure. Thus in an expanded (and more unreadable) diagram, they too would disappear as symbols, just as 'boy' does here).

of the language user, then in order to make use of them the mind would require some internal device for reading (or otherwise sensing) such symbols. Note that computers do represent information symbolically, and they do have electronic sensing devices for reading them and for writing them. But the brain has no such devices. Therefore, if the brain did have a means of storing symbols, it would still have no way to make use of them.

And so we can conclude that the entire linguistic system (viewed as a cognitive system) is purely relational – a network of relationships. Relational networks thus give us the means to visualise what Louis Hjelmslev (1961) may have had in mind when he wrote:

> The postulation of objects as something different from the terms of relationships is a superfluous axiom and consequently a metaphysical hypothesis from which linguistic science will have to be freed.[1]

In being purely relational, relational networks differ from systemic networks, since the latter contain symbols that constitute part of the structure. These

[1] It is interesting that although half a century has now elapsed, most of linguistic science has yet to be freed from this illusion.

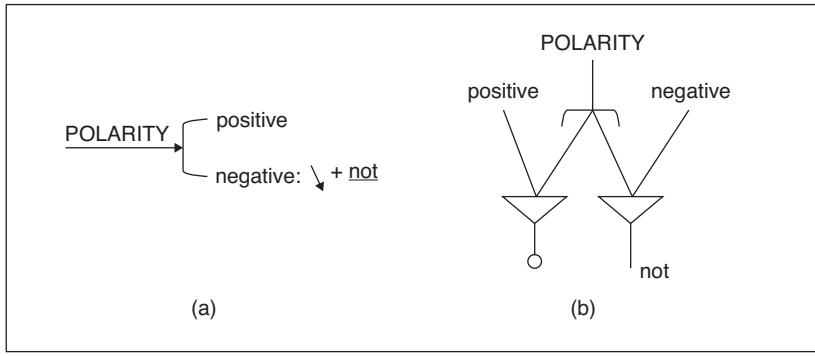

Figure 7.5. Halliday's polarity system, using symbols POLARITY, positive, negative (a) (adapted from Halliday, 2009:66); and (b) translation into RN

symbols represent linguistic items, such as POLARITY, *positive*, *negative* (Figure 7.5a), as well as relationships and operations. In the RN translation of Figure 7.5b, the same labels appear, but they are not intended as part of the structure; rather, they are just labels for portions of network structure, put into diagrams to make them easier to read, like the labels on a highway map. (In a small network fragment, such labels are needed to identify locations in the larger network not shown; but if it were shown, they could disappear just like the *boy* of Figure 7.4.)

A crucial consideration for the concept of *choice* in SFL is that choice is determined by meaning. In Figure 7.5a, the symbols 'positive' and 'negative' represent the meanings that determine which choice is made, and in Figure 7.5b they are shown in different locations from the realisations (rather than adjacent, as in Figure 7.5a). In Figure 7.5b, 'positive' is shown as having a zero realisation, indicated by the tiny circle. On the other hand, there is a further question as to whether the network fragment of Figure 7.5b would actually appear in a properly constructed relational network diagram, for the same reason considered below in relation to Theme selection. That is, since the relational network is intended to be able to operate in a cognitively realistic manner, it may not be correct to assert (as Figure 7.5b does) that there is some point in the formation of an utterance at which the speaker decides whether to make a positive or negative statement. The more realistic alternative would seem to be that the statement will be positive as default unless the speaker has negativity in mind.

Systemic networks can also include various symbols for operations, like the little arrow in Figure 7.5a, meaning 'is realised as'. Halliday (2009:84) provides this list:

Symbol	Meaning	Example
+	Insertion	+x
/	Conflation	X/Y
·	Expansion	X(P·Q)
^	Ordering	X^Z
:	Preselection	:w
::	Classification	::z
=	Lexification	=t

To point out this difference is not to detract from systemic networks. On the contrary, this property of SN gives them the advantage of allowing them to be more flexible in devising large-scale grammatical descriptions. Relational networks provide greater precision as well as a realistic account of the operation of linguistic systems in producing and understanding speech and writing, but at a cost of making greater demands upon the network constructor as well as upon the reader.

7.3 Boundaries of the network

In any case, whether or not that fact is directly portrayed in the descriptive notation, relational networks make it clear that *the whole of a linguistic system is purely relational*, not consisting of linguistic units of any kind; it is relations to other relations to other relations, all the way to the top – at one end – and to the bottom – at the other. Now, one might ask, 'What is that bottom?' The first part of the answer is that it is phonetics. In terms of the cognitive system of the speaker, this means that we have relational network structure all the way down to:

1. connections to the muscles of the speech-producing mechanism; and
2. the cochlea, which receives activation from the sound waves of the speech hitting the eardrum.

At that dual interface we leave the purely relational system and send or receive activation to or from a different kind of physical system. Note that this conception is fitting in terms of the actual physical structures involved, since the structure that concerns us (i.e. linguistic structure) is implemented physically *as neural structure* all the way 'down' to the muscles of the speech-producing mechanism, on the one hand, and the cochlea on the other – each fibre of the cochlea is connected to a sensory neuron. And so from the point of view of the language-using person, the relational network of his linguistic system is implemented (somehow) as a neural network, and at its outer edges there is a transition from relationships to substance; the physical implementation is from neural structures to other kinds of biological structures.

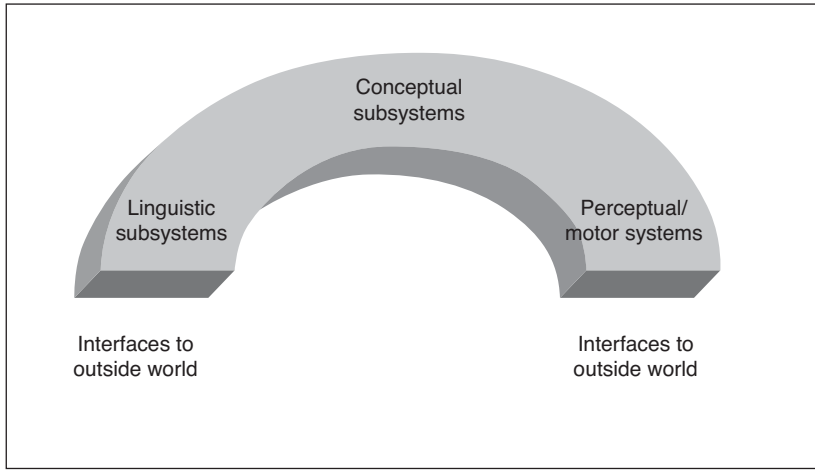

Figure 7.6. The great cognitive arch

What is at the top? Is there a point up there somewhere that constitutes an interface between a purely relational system and some different kind of structure? Upon examination (which was not seriously undertaken for a few years) we can see that as we keep going in what starts as an upward direction, we reach the highest area and then, continuing in what would appear locally to be the same direction, we head downwards, through perceptual and high-level motor control structures, ending up at interfaces which turn out to be at the bottom: sense organs and muscles (Figure 7.6). In the very simplified scheme of Figure 7.6 it is easy to see that moving upwards from the bottom (at left) and continuing in the same direction leads eventually to another bottom (Lamb, 1999:145–147). But the actual system is more complex, in that there is more than one bottom: there is one for each sensory and motor system. It is like a structure consisting of a dome supported by several legs, more like that shown in Figure 7.7. The upper part of the dome is the locus of conceptual relations, and the multiple legs provide interfaces to the world (more than just the four shown in Figure 7.7). And so the completely relational structure applies not only to all of language but to all of conceptual and perceptual and motor structure – all of which is implemented by neural structures of the brain.

7.4 Different notations for different vocations

The simplicity of the derivation of RN from SN described above (Figure 7.1) suggests that there is a close correspondence between the two types of network, but we need to explore how close this correspondence actually is. As we have

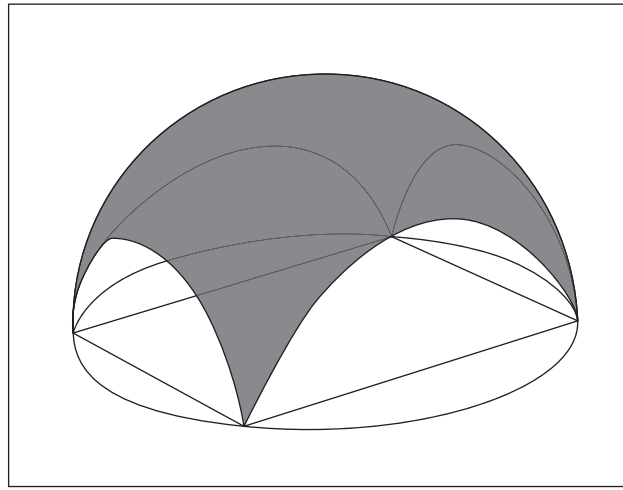

Figure 7.7. The cognitive dome (from Wikipedia: <http://en.wikipedia.org/wiki/Dome>), with the four legs construed as (i) speech input, (ii) speech output, (iii) extralinguistic perception, and (iv) extralinguistic motor activity

already seen, the two network notations differ in the important respect that SN contain symbols as integral components of the structures they depict. And there is more.

We need to keep in mind that SN and RN do not have exactly the same aims. Systemic networks are designed mainly for describing the network of choices available to users of a language. They elucidate the structures of texts by showing how every feature of a text is the result of some choice made by its constructor. This aim requires that the range of available alternatives also be shown; and so the result is a network of choices. The question that has to be asked, then, is, whether this network of choices is the same as (or is part of) the cognitive system of the language user. And my answer is that it is not. Rather, it represents certain properties of the cognitive system, but in an indirect manner.

The difference can be clarified by considering that the cognitive system of the language user is an operating system. Any description of it, therefore, needs to be able to operate – since, if there is anything at all we know about language users, it is that they are able to use their languages. As Charles Hockett used to say, competence is not competence at all unless it is competence to perform. Relational networks therefore are not static interconnections of nodes. They are intended as operational systems. Operation in the network takes the form of activation of lines and nodes. Accordingly, even when they were first described

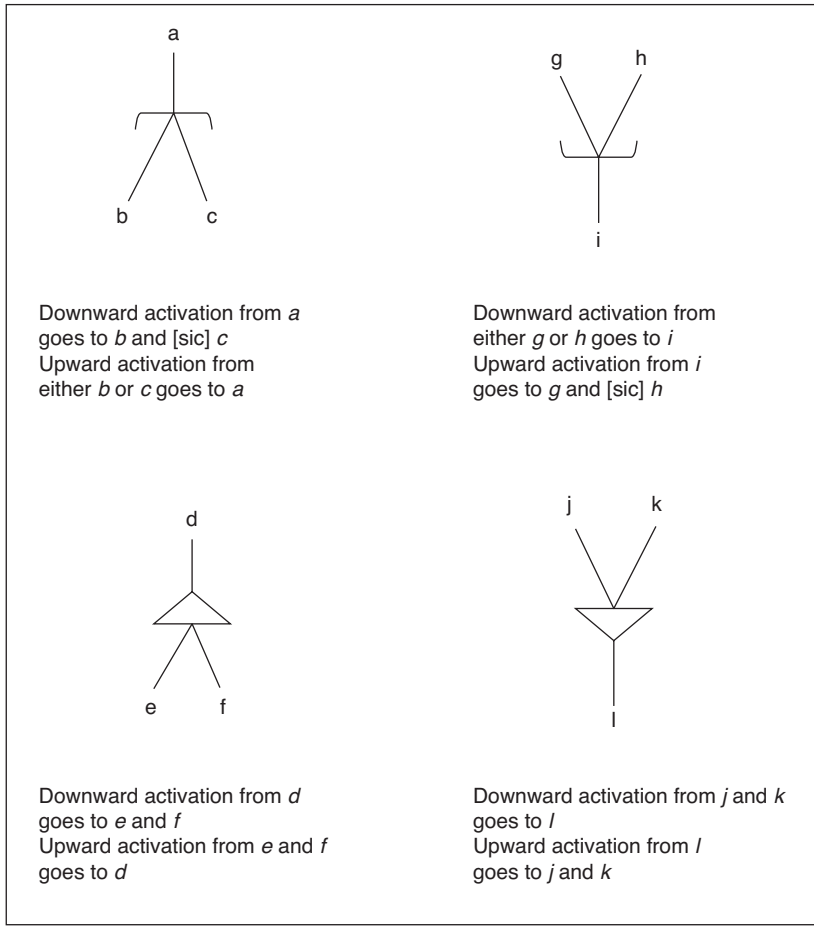

Figure 7.8. Nodes defined in terms of activation

in print (Lamb, 1966), the nodes were defined on the basis of how they treat incoming activation (Figure 7.8). In the case of the downward ordered 'and' (for example, one representing 'personal computer'), if it receives activation from above (that is, from meaning), it sends activation on down, first, to (nodes that will result in production of) 'personal', then to 'computer'.

Similarly, a network as a whole operates by the spread of activation, according to the node definitions, from top to bottom for the speaker, and from bottom up for the hearer. But I hasten to add that the preceding sentence only describes the first rough approximation to the actual details of the operations, for there is

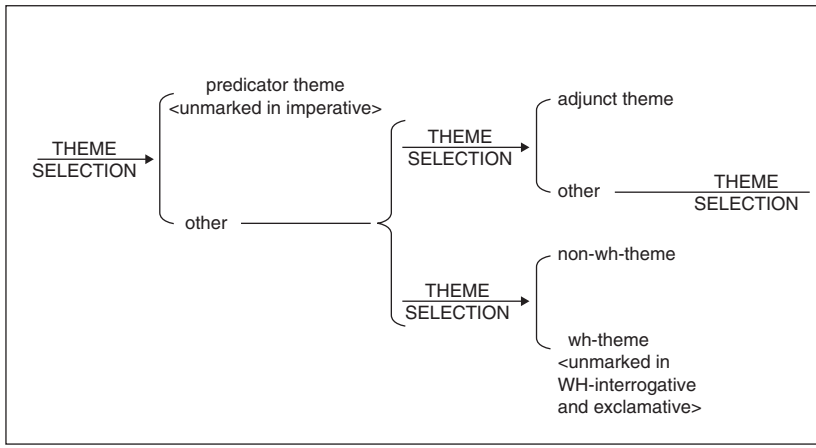

Figure 7.9. Theme in SN version (from Halliday & Matthiessen, 2004:80)

upward activation during speaking and downward activation during the comprehension process. For example, the formulation of a thought starts from conceptual relationships (at the top of the network) and/or perceptual relationships, and activation proceeds down to lexical nodes (providing a wording for the thought); but often there is then upward activation back to the conceptual level in order to provide a 'feeling' of what that choice of words will sound like to the hearer; after which an alternative wording may be selected.

Now of course, systemicists, being realistic, also recognise that people are able to speak and that their linguistic systems must support such activity. What I am asserting here is just that they do not make such operation explicit in SN; it is not part of the task they have laid out for themselves. To elaborate, let us consider the possibility that, just as sentence production proceeds largely from top to bottom in a relational network, it might likewise proceed from left to right in a systemic network. Let us take as an example Halliday's network for Theme selection (Figure 7.9). If we try to interpret this diagram as representing a series of choices actually made in sequence, we have to suppose that the speaker first chooses between predicator Theme or other; then, if 'other' is chosen there is a further choice between two possibilities, each of which leads to further choices; one of them, for example, to the choice between 'non-wh-theme' and 'wh-theme'; and so forth. I don't think that Halliday or anyone else supposes that such a sequence of operations is actually performed. By the same thought, the direct translation of Figure 7.9 into RN (Figure 7.10) does not provide a realistic representation of the way Theme selection operates in the cognitive system of the person forming a clause; it therefore fails to qualify as a plausible RN diagram. What, then, is Figure 7.9 telling us? My opinion is that it is setting

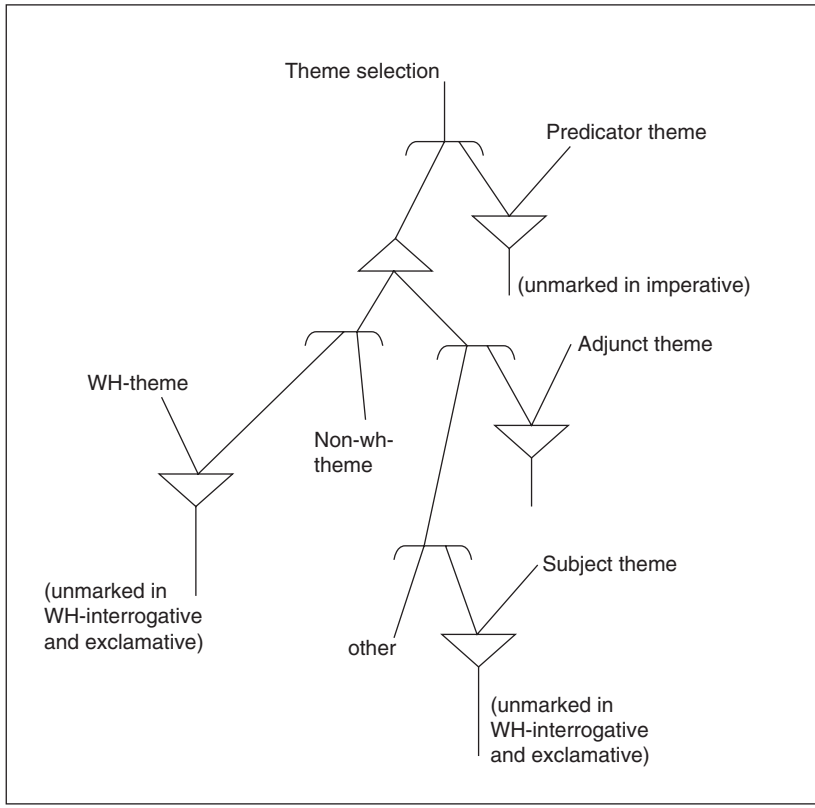

Figure 7.10. Direct translation of Figure 7.9 into RN

forth a classification of the possible types of Theme. Other ways of presenting the classification are possible, as Martin (1987) has suggested, and the choice between such alternatives seems not to be a matter of cognitive significance. The conclusion is that laying out a classification of the range of possibilities is not necessarily telling us anything about how the selection is made by a speaker in any instance (see also Gil, this volume).

We may next ask, then, by what process the speaker actually makes the choice of Theme. I would like to propose that, in keeping with Halliday's insights about Theme selection, when a speaker is forming a clause there is something he wants to say something about – perhaps something in his attention at that moment. Whatever it is is something specific, and not some high-level category like 'wh-theme' to which it may be assigned by a grammarian. That something is active in the speaker's network at the start of the clause formation. Having

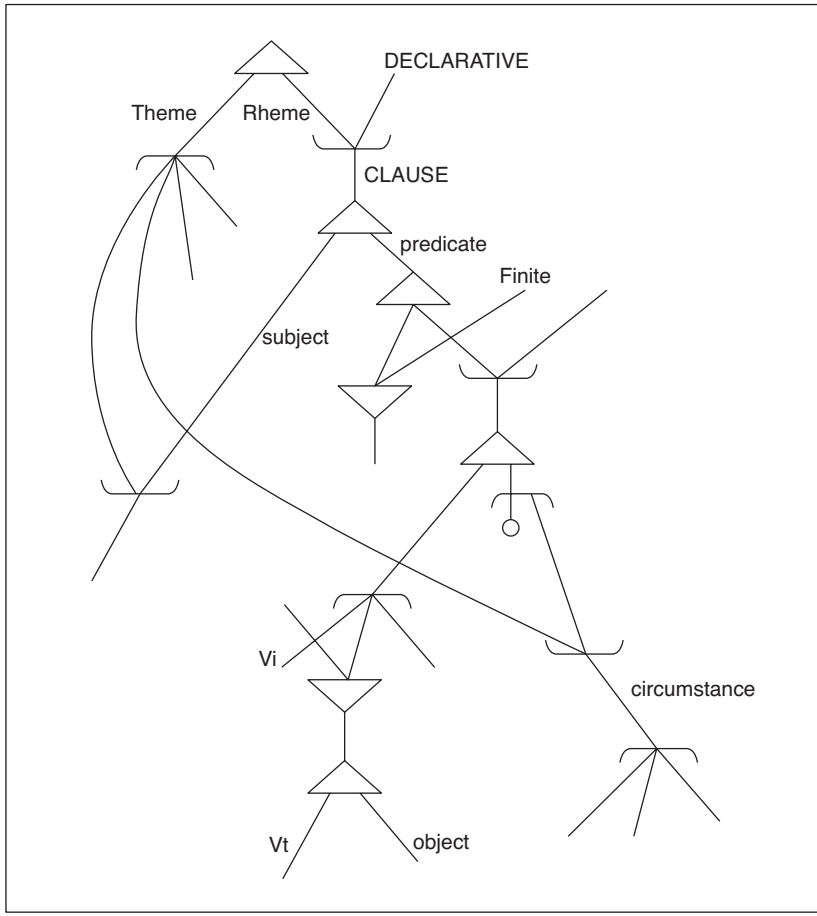

Figure 7.11. Operationally plausible depiction of the theme–rheme construction (in a simplified network for some features of English clause structure)

been activated it comes first, as theme; and the rest of the clause follows, as rheme – whatever it is that he wants to say about it. This conception is depicted in Figure 7.11, which shows the theme–rheme construction in the context of a (partial) description of the English clause. Since the theme–rheme construction is not part of the ideational metafunction, it need not be the expression of any conceptual representation. In this respect, it differs from familiar constructions, those of the ideational function, all of which may be assumed to have conceptual representations.

This principle applies also to the Given–New distinction. Both the Given and the New have ideational functions, but their status as Given and New belongs outside the ideational function and thus calls for different treatment (Lamb, 1999:199–201; 2002:265): the 'Given' is there to identify the location(s) in the conceptual network where the 'New' is to be added, while 'New' represents new connections that are to be formed in the network at that location, or linking those locations.[2]

And so it is not the case that a simple translation from a systemic network to a relational network represents the way the corresponding structures would be depicted in relational networks drawn in accordance with the aims of neurocognitive linguistics. Thus SN and RN describe different phenomena and are therefore complementary (see also Gil, this volume). For the builder of a RN, insightful characterisations of texts such as those provided by SFL constitute evidence for use in the task of describing the linguistic system of the language user. Other evidence comes from the analyses produced in certain other realistic frameworks, such as Construction Grammar, as well as from aphasiology and neuroscience – the latter because the linguistic system is a physical system with a definite location: the brains of people.

7.5 Narrow network notation

The linguistic system may be treated at various levels of abstraction. RN as presented so far in this chapter represents a relatively abstract level, that of the cognitive system of the language user, without considering its neurological basis. It can appropriately be called the cognitive (linguistic) system, and its investigation could be called cognitive linguistics as originally suggested (Lamb, 1971), before that term was taken over by other linguists for other pursuits. If we concern ourselves also with the physical basis of the system, we are involved with neurological structures. For such investigation we can use the term neurocognitive linguistics.

The RN notation described thus far, despite its greater precision as compared with SF notation, still fails to show various details that are needed for understanding the operation of the linguistic system. As mentioned above, the nodes of RN notation are defined on the basis of how they treat incoming activation. By virtue of this property one can put a network into operation for producing or understanding texts. But the details of such operations are not fully specified at the more abstract level of RN notation. For example, the definition of the downward AND stipulates that the activation proceeds immediately down the

[2] It is likely that the interpersonal and textual metafunctions are controlled largely by the right hemisphere, while the ideational metafunction is known to be subserved mainly by the left hemisphere in most persons.

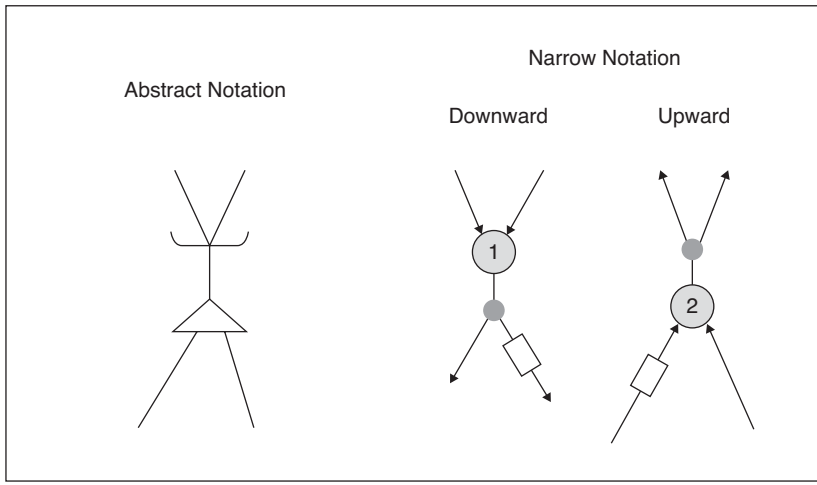

Figure 7.12. Wait elements (shown as small rectangles)

left-hand connecting line, and later down the right-hand line. How much later? How is the timing specified? It seems that this node must have an internal structure, and the same can be said of the downward ordered OR: What is the mechanism that allows one choice to take precedence over the other? Consider also the lines: they are bidirectional – that is, they can carry activation in either direction. This property suggests that they too have an internal structure, consisting of two lines of opposite direction, like a divided highway (dual carriageway). These considerations suggest the need for a network notation of greater precision, arrived at by considering what the internal structure of the abstract nodes has to be to allow them to behave as they do. It may be called the 'narrow notation', and the original one, described above, may be called the 'abstract notation', since it is more abstract. Its lines and nodes can be seen as abbreviations for the more detailed structures of the narrow notation. Accordingly, it has also been called the 'compact notation'. Both are useful for their own purposes, just as highway maps drawn to different scales are useful for different purposes. For example, to get a good overall picture of an area, a map that shows a divided highway as a single line may be better, while for other purposes one might want to see the two directions represented by two lines, along with perhaps the structures of the interchanges.

For the downward ordered AND it is necessary to have a 'wait' element, to keep activation alive until the proper time to send activation down the second line (Figure 7.12). And it is also necessary to have a means of indicating when that proper time is. For example, we have a downward ordered AND for the

clause, first line to Subject, second line to Predicate (Figure 7.11). The Subject must be taken care of – no matter whether it is one syllable (*you*) or a long string of words – before activation can proceed down the line that leads to the predicate. In this case the time of such waiting is obviously variable, since the subject is of variable length, suggesting that feedback timing (feedback to the AND node when the subject is complete) is needed, rather than fixed-interval timing. The latter can perhaps work for phonological structures in which relatively fixed timing operates, as in syllable-timed languages like Spanish. And for feedback timing, the narrow notation needs to show the structures for this feedback. The details of timing are given in *Pathways*, pages 97–102, and other features of the narrow notation are described in *Pathways*, pages 77–83. The notation shown in Figure 7.12 (the small rectangle for the 'wait' element) is an abbreviation for the more complicated structure needed. And for the upward direction a 'wait' element is also needed, but for the connection representing the first element; its activation must be kept alive until activation arrives from the second element.

And so we have three levels of network notation, each with its own usefulness and concomitant limitations: (i) systemic networks, (ii) abstract relational networks, and (iii) narrow relational networks. And this is not yet the whole story, for when we start down the road of providing greater precision, as in the construction of the narrow notation, we find possibilities at every stage for specifying still further degrees of precision. And so we can say that the narrow notation actually includes a range of options for different degrees of narrowness.

Consider, for example, one particularly important feature of relational networks – and of our cognitive systems: the THRESHOLD of node activation. In the abstract RN notation, the threshold is what provides the basis for the difference between the AND and OR nodes (Figure 7.8). Downward activation from both *j* and *k* is required for activation to proceed down to *l*, while activation from either *g* or *h* results in activation on down to *i*. In terms of the threshold we can say that the AND node has a threshold equal to the number of incoming lines, while the OR node has a threshold of 1.

In the narrow notation we can indicate the threshold more directly (Figure 7.13). We use a single node shape – a small circle – for both AND and OR, and we indicate the threshold as a number written inside it. Thus, in Figure 7.13, node (a) is satisfied by activation on either of its incoming lines, so it is an OR node, while (b) and (c) represent the AND situation, as they require activation on both or all three incoming lines. In the case of (d) we have a situation intermediate between AND and OR, as activation on any two incoming lines (or all three) satisfies the threshold. The linguistic situations that call for such precision are not obvious to many grammarians, as they are accustomed to believing (pretending?) that language operates in a very digital

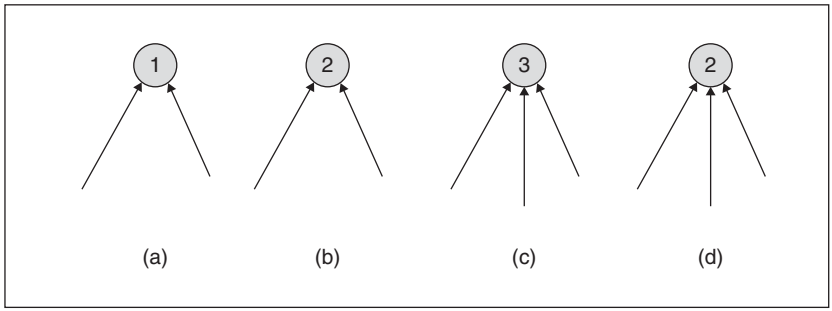

Figure 7.13. Thresholds, represented as integers: (a) – the OR relation, (b) and (c) – the AND relation, (d) – intermediate between AND and OR

fashion: a phoneme either is or is not recognised, by virtue of having all its features present; similarly for lexemes. But a little reflection on the matter makes it apparent that such views are oversimplified. For example, in a noisy room your phonological system may not be able to process every feature of what is being said to you, but you are likely to understand it anyway. It is permissible to oversimplify when we are engaged in reaching an initial understanding of how language works, but if we really want to understand language as a living system, we have to recognise finer distinctions. Nuances of threshold like those suggested here become particularly important for the understanding of conceptual structure.

This treatment of the thresholds of nodes enables us to reach a greater degree of precision than is provided for by the abstract notation. But we can now go further down that road and consider still greater degrees of precision. First, we have to recognise that different connections have different strengths. The connections for well-entrenched forms have greater strength than those for less-entrenched forms. In fact, it is on just this basis that we can provide a structural basis for the notion of entrenchment. Differences in connection strength can be indicated in the notation by varying thickness of lines, or by little numbers written next to lines.

Second, we have to recognise that a line of a given strength can carry varying degrees of activation at different times. And this factor is closely related to the next: a threshold can be satisfied to varying degrees. And so if a node is weakly satisfied, it sends out weak activation; if strongly satisfied, it sends strong activation. Therefore, the activation of a given connection is a function of two independent variables: (i) the connection strength, and (ii) the degree of activation it is receiving, which depends on the degree to which the node from which it is receiving activation has been satisfied. Such considerations allow us to explain prototypicality phenomena.

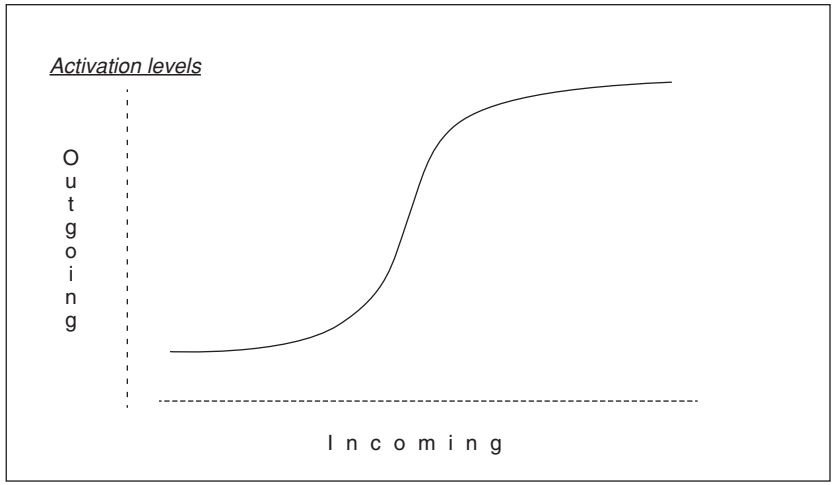

Figure 7.14. Threshold function: degree of outgoing activation as a function of incoming activation

And so we see that the use of integers to indicate thresholds, as in Figure 7.13, is no more than a very rough approximation to reality, even though it offers greater precision than the abstract RN notation. What we really have are – not fixed threshold values, and certainly not integral values, but – *threshold functions*. Figure 7.14 shows, roughly, the presumed general form of the typical threshold function. A small amount of incoming activation results in negligible outgoing activation; then the curve rises steeply in the middle range; and for a very large degree of incoming activation an additional increase results in very little additional outgoing activation.

An important lesson is that a greater degree of precision in notation, and the greater care in observation that is encouraged by it, make it clear that linguistic structure is really analogue in nature, not digital as we are led to believe with the encouragement of cruder notations.

7.6 Relational networks and neural networks

At the level of narrow notation, one can confront the issue of neurological plausibility; it becomes reasonable to propose hypotheses of how the nodes and links of the narrow notation are implemented in cortical columns of neurons and their interconnections (cf. Lamb, 2005). It is important to be aware that all of the structural features of narrow notation described thus far are arrived at solely on the basis of linguistic evidence, including considerations of linguistic processing (along with considerations of learning) – *not* neurological evidence.

Therefore, they present us with a set of hypotheses about neural structures and their operation. We can next turn to neuroscience for the purpose of checking these hypotheses.

For example, consider the hypothesis that all of the information is represented as connectivity, involving lines and nodes. The hypothesis is confirmed by neuroscience. The brain operates by means of interconnected neurons. Neurons do not store symbols; they only receive activation via connections from other neurons, and they transmit activation through additional connections.

Next, we have hypothesised that nodes can transmit varying degrees of activation in response to varying degrees of incoming activation. This hypothesis corresponds exactly with what is found in the transmission of neural activation. The amount of activation transmitted along the axon of a neuron is greater when the neuron is receiving strong activation to its dendrites (input fibres) and its cell body than when the incoming activation is weak. For neurons, the different degrees of outgoing activation are implemented as different frequencies of transmission of neural impulses, more or fewer per second.

And so forth. It turns out that *all* of the hypotheses suggested by the form and operation of relational networks as represented in narrow notation are confirmed by neuroscience as properties of the anatomy and operation of neural structures (Lamb, 1999:320–329).

7.7 Levels of precision in description

And so we have several different levels of notation available for different levels of precision. Systemic networks occupy a high level, which makes them suitable for describing linguistic phenomena of importance to language teachers, translators, grammarians and others. At lower levels we have the purely relational notations, the lower of which can be directly related to the still lower level of neural structures. Like the different notations and descriptions used in biology, biochemistry, chemistry and physics, each of the levels of description has its own usefulness, and the value of each is enhanced by its demonstrable relationships with the other levels.

Systemic networks are especially useful for understanding the various types and subtleties of meaning conveyed in texts. RN notation is suited to describing (portions of) the cognitive systems of individuals. And the narrow RN notation is useful for helping to understand how the brain works. As all of these areas of application are valuable, all of the levels of notation are useful, each in its own way. Their different levels of precision are somewhat like those of the different notation systems used in chemistry for organic compounds. Consider also the structure of water. For many purposes it works fine just to say that water is chemically H_2O, but a more precise understanding requires a notation that

shows the relative positions of the three components, with the two hydrogen ions roughly at one side of the oxygen, so that the molecule resembles a Mickey Mouse balloon. This way of viewing water makes it easier to understand how molecules can group themselves in chains and related structures, and it also helps in the process of attempting to understand the enormous diversity of structure of snowflakes, formed when the temperature causes the widely varying structures of liquid water to crystallise. There is simply no way to approach an understanding of these phenomena if we just consider a water molecule to be H_2O.

The task of constructing systemic networks makes fewer demands on the network builder and thus allows greater flexibility and allows the grammarian to cover more territory. That feature is what makes SN notation more useful for describing grammatical structures for the sake of, for example, language teaching. RN notation, on the other hand, offers greater precision for descriptions, for the sake of those interested in operational and neurological aspects of language, but this property also makes greater demands both on network builders and upon the readers of their handiwork.

7.8 An additional bonus of narrow notation

We have seen that using a narrower notation allows depiction of greater detail. A bonus is that it makes it easy to show additional connections that help to explain phenomena whose subtlety escapes more abstract notations. Let us consider two examples.

The first one comes up when we consider how the two directions – shown separately in narrow notation – are connected. It is a question that simply does not come up as long as we are working with the abstract notation, since the two directions are represented together in the same lines and nodes. Figure 7.12 shows a typical network fragment in abstract notation and in narrow notation. As these are two separate fragments in narrow notation, the question arises (which does not pop up until the move is made to narrow notation): Are they together, as the figure shows, or are they separate? And a further question is: How (if at all) are they interconnected? To the last question we can answer with some assurance that they must be interconnected in order to achieve co-ordination; for example, when one hears a syllable (upward direction), one can repeat it (downwards) immediately, even without recourse to meaning, as shown by the fact that this operation is possible with nonsense syllables. At this point, we can turn to what is known about cortical structure and function for the best evidence. It shows that the upward and downward directions for phonological structures are in two widely separate areas, the temporal lobe and the frontal lobe respectively, and that they are connected

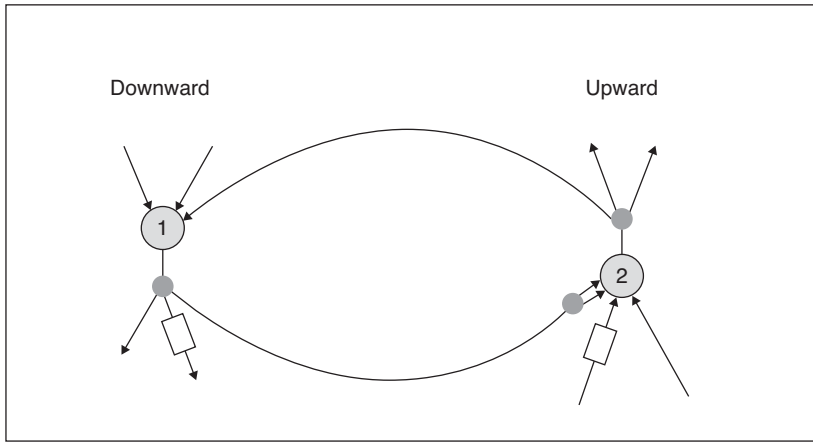

Figure 7.15. Structures for the two directions in different areas

by fibres of the arcuate fasciculus. And so the situation can be shown as in Figure 7.15.

Another example of the greater precision provided by narrow network notation is the enhancement it provides in understanding systemic functional choice. And this brings us to the final section of the chapter.

7.9 Choice in Systemic Functional Linguistics

As mentioned above, when we start down the road of further specification using the narrow notation, we can go on and on. We can in fact be fairly confident at any step that further details can be added. So it is with the 'system' of Systemic Grammar. At first approximation, it corresponds to the downward OR of RN, as shown in Figure 7.1. But the RN notation of Figure 7.1 shows only part of the structure. The next step is to make explicit that the choice is determined by meaning. So in Figure 7.5, for example, the symbols 'positive' and 'negative' represent the meanings that determine which choice is made (see Figure 7.10 for further examples). SN allows for realisations to be shown by additional symbols (as in Figure 7.5a), but in RN everything is in the connectivity of the network. Accordingly, the abstract notation shown in Figure 7.16 has the meaning 'b' above and its realisation below, likewise 'c' and 'R(c)'. Figure 7.16 also shows the equivalent narrow notation for the downward direction.

But, as illustrated above in the successively refined treatments of thresholds of nodes, we can invariably add further details. In the case of the downward OR relationship (i.e. the 'system' of Systemic Functional Grammar) the next

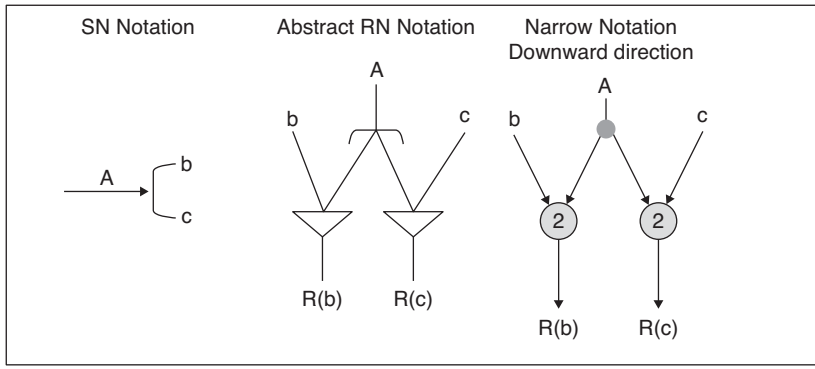

Figure 7.16. RN depiction of a system at three levels of precision

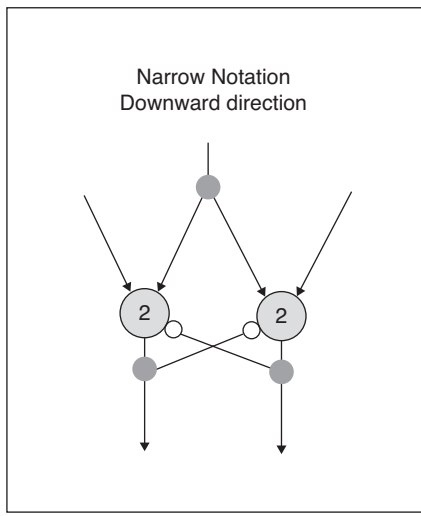

Figure 7.17. A system in narrow notation showing additional structural details: enhancement of contrast (inhibitory connections indicated by tiny circles)

refinement is shown in Figure 7.17, which makes explicit that each of the alternative choices, when chosen, sends inhibitory activation to its competitor (an inhibitory connection is indicated by a tiny circle, in contrast to excitatory activation, indicated by an arrowhead). This important further specification provides for enhancement of contrast and, like other features of narrow RN notation, it is supported by neuroanatomical evidence. (In neuroscience this

mutual inhibition of competitors is known as 'lateral inhibition'.) This additional network structure is what, finally, provides operationally and neurologically plausible justification for Michael Halliday's original insight that led him to focus upon systems when he designed his networks. Systemic networks put the emphasis on systems to provide recognition for Saussure's important principle that everything meaningful has meaning *in contrast to what could have been selected instead*.

8 The twin paradoxes of unconscious choice and unintentional agents: what neurosciences say about choice and agency in action and language

Elissa Asp

> . . . any theory of language or semiosis in general that cuts itself off from a serious reflection on the ways in which the study of human-meaning-making activity relates to human consciousness and agency simply fails to account for the very nature and purposes of language . . .
>
> Thibault (2004:1)

8.1 Introduction

Systemic functional models of language posit system networks as central characterisations of meaning potential, and acts of meaning as 'acts of choosing' from the options specified by the networks (e.g. Halliday, this volume). Associated with 'acts of choosing', one might anticipate agency and further, that agency be associated with consciousness and intention. However, Halliday has consistently added caveats to descriptions of choice in language that *the choices speakers make are not normally conscious* but may be brought into consciousness should the need arise (e.g. Halliday & Matthiessen, 2004:24; Halliday, this volume) and that *choice* is a gloss for meaning potential and *does not imply intention* (Halliday, 1995b:45). These positions pose the paradoxes of unconscious choice and unintentional agents and raise (at least) two questions relevant for functional linguists interested in discourse: If consciousness and intention do not inform speakers' choices, in what sense are we agents of our discourse or other actions? And if speakers are not agents, in what senses can we be responsible social actors?

The purpose of this chapter is to explore these paradoxes through selective review of recent works in linguistics and clinical and theoretical neurosciences exploring agency and activation patterns in language, discourse and action. After sketching salient features of choice in systemic functional models, the review is presented in two parts. The first frames agency, consciousness and choice within current executive/control function and default mode models and challenges to agency from imaging studies exploring relations between actions and conscious intentions. The second part briefly reviews evidence for the neural systems supporting choice in language and discourse. By way of summary

and conclusion, I offer some observations about choice with respect to agency and consciousness as follows:

- non-reductionist accounts of choice will accommodate both conscious choice and relatively automatised selection carried out by agents;
- the large-scale functional neural networks that enable both conscious and automatised choices interact with each other so understanding how choice works requires understanding the contributions these interactions make to selection processes;
- discourse processing recruits not only language and memory networks, but also the neural circuits associated with control of action, affect and cognition.

Additionally, investigations of neural connectivity and network activity, and the effects of damage, suggest that:

- choice (selection) is a central neural process for linguistic production and interpretation;
- hierarchically structured systems with entry points at superordinate levels are not likely apt characterisations of neural organisation;
- there is broad support for metafunctional characterisation of discourse as a type of action;
- there is limited evidence for metafunctionally based clustering of linguistic systems within the perisylvian networks.

These observations are offered as programmatic in developing neurocognitively tenable process models for language and discourse, a project I am interested in as part of ongoing work in developing clinical discourse analysis (e.g. Asp & deVilliers, 2010). Figuring out where choice fits and how it works in neurocognition may lead to new insights in language processing and its impairments, and in understanding agency and consciousness in relation to discourse.

8.2 Choice

In SFL formulations (e.g. Halliday, this volume), meaning is defined as choice and acts of meaning are constituted by acts of choosing. System is posited as the formal representation of paradigmatic options (choices) that characterise the semiotic potential of a language. Choices are not random but constrained within a grammar by strata, function and structure. Moreover, available choices are constrained and motivated by functional contexts of utterance and interpretation: speakers are conceptualised as 'speakers-in-contexts' who make choices using present and prior experience to interpret, respond to and create the instantial situations of their 'present'. Halliday also points to the probabilistic weighting of choice relative to demography: speakers' context(s) of culture influence the likelihood of particular choices occurring in particular contexts of situation. Positing choice as a continuous process – relevant at and constrained

within each level of description – makes the resulting framework attractive as scaffolding for a process model in so far as

- it provides a template for 'choice points' which, at least theoretically, could be aligned with temporal order in speech processing;
- it specifies (idealised) options available at each choice point;
- idealised options may be probabilistically weighted in terms of prior and current context and discourse, speaker demographics and so on, bringing the ideal nearer to real (or at least more likely) options in text production;
- it assumes functional motivation – at the level of the speaker who engages in goal-directed activity when s/he talks and in terms of the grammar s/he uses, since it assumes that languages are functionally adapted to meet communicative demands speakers-in-contexts make.

This is not to claim that SFL models speech processes. Indeed, Halliday and Matthiessen (1999:42, n.15) explicitly say it does not – only that it incorporates useful features for modelling linguistic and discourse processes.

However, as already noted, Halliday has also stated that the choices speakers make are neither conscious nor intentional (e.g. Halliday & Matthiessen, 1999, 2004; Halliday, this volume). In some articulations, speakers disappear altogether and it is the grammar, not the speaker, that makes choices and construes meaning (e.g. Halliday & Matthiessen, 2004:24). The possible interpretations of assertions about the unconscious and unintentional character of choice include the uncontentious ideas that:

- speakers do not have direct access to and conscious awareness of the neurophysiological processes underlying choice;
- speakers typically lack explicit knowledge of the grammars they use;
- even in speakers with specialised grammatical knowledge, the occasions when speakers are likely to focus on their grammatical knowledge to produce a particular structure type are rare;
- much of what we say and do is highly automatised, making minimal demands on attention or conscious awareness.

Positing conscious awareness of the neurophysiological process of selection would be akin to positing conscious awareness of the neurophysiological processes that let us walk or ride bicycles. Explicit knowledge of grammatical systems is typically the provenance of experts of various kinds, and automatisation is not only an effect of repetition but necessary for efficient neurocognitive function and learning (e.g. Garrido *et al.*, 2009; León-Carrión *et al.*, 2010). However, there are at least two other interpretations of denials of consciousness and intention in choice:

- language behaviour is not related to any conscious plans, goals or intentions we may have;
- conscious intentional choice is most relevant 'outside' language per se, as a function of the use of language in, or as, action.

The first of these possibilities presents the problem of agency in discourse. The second offers a solution by inserting a boundary between language and its use.

8.3 Networks for agency and choice in action and cognition

8.3.1 Agency and executive control functions

This section defines agency as used here and outlines the contributions of executive control function research to understanding consciousness and agency in relation to choice. It also discusses neuroimaging studies challenging notions of agency that presuppose conscious selection.

Here, an agent is a *doer of an action* who has *the capacity for intention*. This agent is based on discussion in Jackendoff (1990:128–129) on argument roles / thematic relations. It thus differs from Halliday and Matthiessen's use (e.g. 2004:289), where intention is not relevant for agency. The intentional sense of agency is consonant with use in clinical settings where it is associated with our ability to carry out not only complex activities requiring significant planning and decision-making, such as preparing a lecture or planning a trip, but also everyday activities like making coffee in the morning which, though complex in themselves, may be more automatised and carried out with limited attention.

The ability to successfully perform such activities depends in part on 'executive' or 'control' functions. For example, in an early articulation, Norman and Shallice (1986:377) proposed a 'supervisory control system' to regulate actions requiring directed attention. They included actions that involve planning or decision-making, error correction, are 'ill-learned' or novel, dangerous, technically difficult, or require 'overcoming a strong habitual response or resisting temptation'. Their list is indicative both of the type of process for which executive control is postulated and of the kinds of function necessary for such processes, such as selection, inhibition, monitoring and maintenance (e.g. Royall *et al*., 2002). Each of these has associations with anatomically and functionally distinct but interacting circuits with transmodal 'hubs' in frontal cortex and with inputs from other large-scale networks associated with memory, language, affect, vision and so on (Mesulam, 1998; 2000:1–120).

Maintenance and manipulation of information online for processing is supported by a circuit centred in the dorsolateral prefrontal cortex (PFC). Processes that make extensive demands on working memory, like planning and reasoning, recruit this circuit (Alverez & Emory, 2006). Monitoring of information (including error and anomaly detection) and initiation/response selection involve a loop centred in anterior cingulate cortex (Mesulam, 2002). Damage in either of these circuits can result in reduced initiation and blunted or flat affect, while dorsolateral damage is also associated with general cognitive slowing and anterior cingulate damage, with attention problems (Royall

et al., 2002; Rushworth *et al*., 2007). Inhibition of initiated motor responses and likely generally of cognition relies on a circuit centred especially but not exclusively in the right ventrolateral PFC (Aron, 2007; Swick *et al*., 2008 for bilateral inhibition). Damage here limits ability to inhibit motor responses and, broadly, to ignore irrelevant information (Aron, 2007; Dillon & Pizzagalli, 2007). Selection associated with decision-making and action planning is supported by an orbitofrontal/ventromedial circuit (Krawczyk, 2002). This circuit receives indirect projections from all except primary sensory processing areas and from areas associated with emotion and memory (Kringelbach & Rolls, 2004). It also has dense connections to the other frontal circuits (Mesulam, 1998; Kringlebach & Rolls, 2004). This combination of inputs helps to explain the role that the orbitofrontal/ventromedial circuit has in making emotionally or socially salient decisions. However, the orbitofrontal circuit also appears to have a broader role in decisions, action selection and prospective thinking – tracking information that is affectively neutral, but salient for selecting, maintaining and shifting goal-directed behaviour (e.g. Boorman *et al*., 2010; Burgess *et al*., 2011). Dysfunction in this circuit affects decision-making, social behaviour, insight and judgement, although other cognitive skills may appear normal (Mesulam, 2002). Figures 8.1a and 8.1b provide labelling for lateral and medial views of the brain.

The literature on cognitive control also posits a general organisation of the frontal cortex from front (anterior/rostral) to back (posterior/caudal). More abstract functions and processes (variously construed as superordinate, temporally extended, relationally complex) are associated with more anterior frontal regions, and less abstract functions and processes (subordinate, temporally proximate, relationally simple) with more posterior frontal regions (e.g. Badre, 2008; Badre & Wagner, 2007).

What these circuits point to is not that the frontal lobes are a centre for a homunculus-like 'central executive'. Rather, the patterns of connectivity of frontal circuits are such that they can support the sort of complex integration of information from different sources that is necessary for executive control, enabling complex, goal-directed, contextually relevant action and cognition. And very saliently, clinical work shows that damage or dysfunction in these networks differentially impairs these abilities. To paraphrase Mesulam (2002), these circuits are what allow the shift from stimulus-bound, time-limited, egocentric reaction to context-independent cognition and contextually relevant, socially appropriate interaction that (optimally) characterises human adult behaviour.

The executive control functions as described allow us to at least imagine that agency or 'intentional action' is possible in so far as they present a model for extended controlled attention to contextually salient information and mechanisms for evaluating, selecting and inhibiting information and action. Imaging

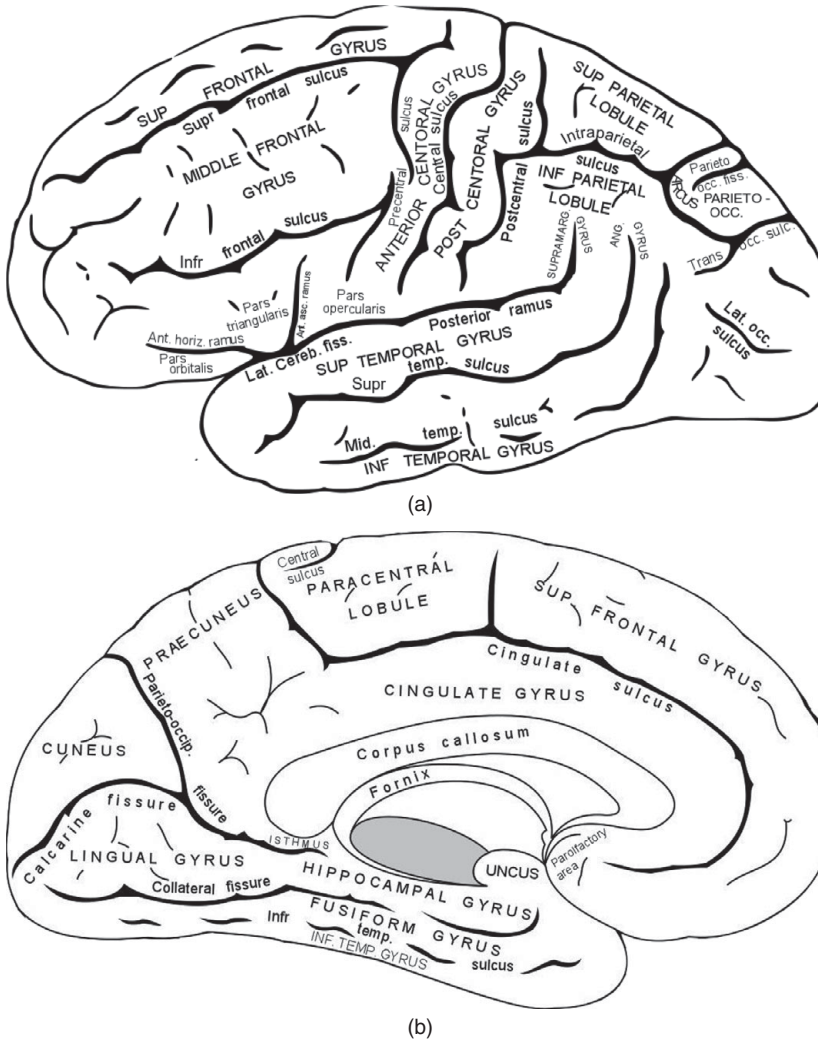

Figure 8.1. (a) Lateral view of brain with major structures labelled from *Gray's Anatomy*, Plate 726; (b) medial view of brain with major structures labelled from *Gray's Anatomy*, Plate 727

studies challenging this model specifically address the role of 'conscious intention' in relation to action, which, since the work of Norman and Shallice (2000), has been presupposed in executive control models. For example, following up on early work (Libet *et al*., 1983) showing that patterns of EEG activity

preceding voluntary actions also precede conscious awareness of initiating movement, Soon *et al*. (2008) and Bode *et al*. (2011) conducted fMRI experiments investigating the extent to which conscious intentions cause actions, focusing directly on selection as the relevant process.

Soon *et al*. (2008) showed that activation patterns in lateral and anterior medial PFC and the precuneus/posterior cingulate predicted an upcoming motor decision to voluntarily press a button with either the right or the left hand approximately seven seconds prior to participants' conscious awareness of the choice. They also found predictive information in supplementary motor areas associated with planning motor actions about five seconds prior to awareness. Activation in primary motor areas did not appear until after the decision became conscious. The activation patterns seem to run in parallel once they start until their relevance is exhausted: prefrontal activations persist until the choice becomes conscious, and activity in precuneus/posterior cingulate and supplementary motor areas persists until the action is complete (Soon *et al*., 2008: Supplementary Figure 5). Bode *et al*. (2011) replicated the task and, with minor differences, the result. Both papers infer from the evidence they present that the temporal sequence represents a causal chain. So their response to the question 'Do our conscious intentions cause our actions?' is 'No'.

However, it is worth noting that the experimental task used to investigate the relation of 'conscious intention' to action bears little resemblance to the sorts of activities for which Norman and Shallice originally postulated a supervisory attentional system for 'willed action'. Specifically, the task was rehearsed, cognitively empty in so far as it demanded no planning and presented no possibility for error or risk, and affectively neutral. Indeed, outside the research setting, hand choice might go unnoticed (Pacherie, 2008). Nevertheless, in both studies, participants did report awareness of their choices. The reported time of awareness of conscious intention prior to action is brief, between one and a half seconds before to within the half second when action is performed. This is short, but since action inhibition is possible within about a quarter of a second, the sequence in the Soon study is open to inhibition (Dillon & Pizzagalli, 2007). That is, assuming intact monitoring and inhibitory abilities, the choice may still be made.

The presence of neural activity predictive of choice prior to conscious awareness of a plan for motor action does not necessarily imply an inexorable chain of causation from unconscious selection to action, with our 'conscious selves' appearing as epiphenomenal spectators occasionally peeking over the barricades of unconsciousness. Such a view challenges our phenomenological experience of ourselves as conscious agents, while it also seems to ignore neural activity in other control circuits and the extensive evidence that damage to these circuits results in behavioural changes that reduce people's capacity to act effectively or respond appropriately to their environment.

What can be extracted from these studies is a partial perspective on choice as a process. It is a process that

- involves unconscious activation in the PFC and other regions that may predict the outcome;
- has the potential for conscious awareness that precedes activation of motor programmes;
- is open to revision through inhibition or reselection.

For more salient choice types, other executive function capacities might lead to delay between selection and activation of motor programmes while we inspect a choice for its potential for implementation, its likely consequences, and so on. This is normal 'planning', likely when decisions relate to more complex, consequential and/or temporally distant activities (Burgess *et al*., 2011; Pacherie, 2008). In sum, despite the presence of unconscious predictive neural activity, there is nothing in the work reviewed that necessarily excludes agency so long as choice is not isolated from other processes and networks.

8.3.2 The default mode network: the sandbox of consciousness

The networks supporting executive functions are engaged during activities that require attention. However, there is another network, referred to as the 'resting state' or 'default mode' network, which is defined by patterns of neural activity that appear when people are quietly resting, not thinking about anything in particular (Raichle *et al*., 2001). It reflects an assortment of processes associated with episodic memory integration and consolidation, self-reflection and evaluation, imagining future scenarios, interactions and so on (see Buckner *et al*., 2008 for a review). The network overlaps with medial prefrontal and semantic and episodic memory networks, but the hub of the default mode network is thought to be the precuneus (Cavanna & Trimble, 2006). It is relatively deactivated when people engage in tasks demanding attention to external stimuli unless, as Binder (2012) has pointed out, those tasks are semantically oriented. The relevance of the default mode network here is that it represents the flip side of the effortful mental activity associated with goal-directed action and cognition – it is a sort of sandbox of consciousness. If we ask where ideas and attitudes that inform our choices originate, this might be the relevant network.

8.4 Language networks

The executive function and default mode networks together suggest a neurocognitive architecture for consciousness and the kinds of processes that characterise it. The contents of that consciousness are mediated through interaction of these networks with other large-scale networks with their own functional specialisations, one of which is language (Mesulam, 1998, 2000). This section briefly

reviews evidence for the language network, and then describes the functional contributions of frontal and posterior regions in relation to choice in language and discourse.

Based on studies in clinical and healthy populations, Mesulam (2000) sketched revisions to the 'classical' language network, extending frontal 'Broca's area' from 'the posterior left inferior frontal gyrus' (LIFG) to include all of the LIFG and similarly, extending posterior 'Wernicke's area' from 'posterior third of the superior temporal gyrus' to heteromodal areas in inferior parietal cortex and middle temporal gyrus (see also Bookheimer, 2002; Stowe *et al*., 2005). Others include an inferior bit of the dorsolateral prefrontal cortex in the frontal area since it may be recruited in verbal working memory tasks (Gruber, 2001; Vigneau *et al*., 2006), and lesions here (and in adjacent pars orbitalis) have been associated with comprehension difficulties for complex syntactic structures (Dronkers *et al*., 2004). A ventral bit of the pre-supplementary motor area is also regularly included in the frontal language area (e.g. Gold & Buckner, 2002; Haggort, 2005). Similarly, lesion and imaging studies over the past decade have led to extension of the posterior language area to the inferior temporal gyrus and anterior temporal lobe including the anterior temporal poles (e.g. Damasio *et al*., 2004; Schwartz *et al*., 2009; Snijders *et al*., 2009; Snijders *et al*., 2010; Holland & Lambon-Ralph, 2010).

Work using diffusion tensor imaging (DTI) on white matter pathways provides evidence of structural connectivity for such proposals. Most notably, Catani and colleagues (2005) offer evidence that the arcuate fasciculus, the 'classical' connection between frontal and posterior language areas, consists of a direct pathway and two indirect pathways (compare Glasser & Rilling, 2008). The direct pathway links temporal cortex and LIFG, but extends anteriorly into dorsolateral and premotor frontal areas (middle and precentral frontal gyri) associated with working memory and motor planning, and posteriorly into the middle temporal gyrus associated with lexical representations. Anterior and posterior indirect bundles link LIFG and temporal cortex respectively to supramarginal and angular gyri in the inferior parietal cortex. The anterior bundle might support verbal working memory (Catani & Mesulam, 2008) and the posterior bundle links areas associated with lexical selection and transmodal semantic representations (Binder *et al*., 2009). Additionally, Catani and Thiebault de Schotten (2008) explore connectivity in three ventral fibre tracts. Two of these connect the occipital lobe with orbitofrontal and middle and inferior temporal gyri and likely have some role in the integration of visual information with linguistic representations (Catani & Mesulam, 2008). The third, the uncinate fasciculus, links anterior temporal poles to medial and lateral orbitofrontal cortex, including anterior LIFG. This tract may support semantic and episodic retrieval and integration, and controlled selection in discourse processing. Finally, DTI investigation of frontal−basal ganglia−thalamic

circuits has offered evidence supporting the executive control networks discussed above, and also identified an analogous network including LIFG in such a loop (e.g. King *et al*., 2012).

Thus, the resultant cortical distribution of the language network resembles the large-scale distributed networks associated with executive control functions in so far as there is evidence that the language network participates in a frontal–basal ganglia–thalamic circuit mediating at least some aspects of controlled processing, and that the posterior and frontal 'epicentres' (to borrow again from Mesulam) of the language network contribute broadly to 'content' and 'control' respectively. Furthermore, although such networks may be tuned to particular kinds of process and/or input, the frontal areas "can dynamically shift affiliation" depending on task demands, neuronal integrity and so on (Mesulam, 2000:90–91). For example, a bit of neural tissue that responds, say, to structured sequences in one modality, is likely to respond to structured sequences from other modalities (and networks). We see this in posterior Broca's area (pars opercularis) in studies that show activation overlap for sequences of tones and syllables (Gelfand & Bookheimer, 2003), syntactic sequences (Friederici *et al*., 2006; Thothathiri *et al*., 2010), abstract sequences (Petersson *et al*., 2012), and for imitating (Iaccoboni *et al*., 1999) or imagining (Binkofski *et al*., 2000) finger movements.

8.4.1 Functions of frontal circuits in language

Turning from anatomy to function, the frontal language area contributes to aspects of phonological, syntactic and semantic comprehension and production as well as to other kinds of processing just noted (Bookheimer, 2002; Stowe *et al*., 2005; Vigneau *et al*., 2006). The current debates are whether sub-regions within this area are 'domain-specific' for semantic, syntactic and phonological processing, whether any 'processes' in the sense of some sort of computation or function are actually carried out in this region, and if they are, whether any of them are language-specific or are 'domain-general' functions like maintenance, selection and inhibition. Reviewing the evidence, Bookheimer (2002) and Hagoort (2005) argue for an anterior to posterior distribution of processing in LIFG with more anterior regions associating with semantic processing, and the middle and posterior areas associating with morphosyntactic processing, and posterior regions with phonological processing. The domain-specific argument has an appealing logic in so far as posterior LIFG (BA 44) and adjacent cortex (BA 6) are densely connected to each other (Ford *et al*., 2010) and associated with motor planning, and thus plausibly support morphosyntactic, phonological and articulatory representations of structured sequences. Moreover, there is an established role for posterior frontal areas (BA 44−6) in a fronto-parietal network for verbal working memory (e.g. Gruber, 2001).

Localisation of semantic processes to middle and anterior regions (BA 45–47) also has a tidy logic in so far as the white matter connectivity described above links these areas not only to posterior temporal and inferior parietal lobes but also to the rich semantics of anterior and middle temporal regions via the extended arcuate fasciculus and uncinate fasciculus. In favour of domain specificity, some studies show that anterior LIFG is activated in semantic tasks (e.g. Badre & Wagner 2005, 2007; Sabb *et al*., 2007). However, on the 'domain-general' side, Gold and Buckner (2002) demonstrated that both anterior (BA 45–47) and posterior (BA 44–6) LIFG activate in tasks requiring controlled retrieval of semantic and phonological information, but the areas they interact with in posterior cortex differ by domain. In the semantic task, these regions co-activated with left middle temporal gyrus (BA 21) associated with lexical selection, while in the phonological task they co-activated with premotor cortex (BA 6), and left parietal cortex near the supramarginal gyrus (BA 40) (also Gold *et al*., 2005). Badre and Wagner (e.g. 2005, 2007) have also offered evidence that pars triangularis (BA 45) is involved in domain-general post-retrieval selection among activated alternative representations. Action inhibition also recruits pars triangularis (BA 45) bilaterally (Swick *et al*., 2008).

There is, then, evidence for both domain-specific and domain-general organisation of LIFG. Given the character of the other large-scale functional networks and the evidence from lesion and imaging studies, the role of LIFG in language processing may be similar to that of the other control networks – contributing to the retrieval and maintenance of linguistic information for selection and unification/integration in the stream of discourse with specific contributions determined by task and capacity of cortical and sub-cortical networks. Under this interpretation, 'rostral–caudal' organisation for control in the LIFG specifies functions rather than contents, with controlled retrieval most anterior (BA 47), controlled selection/inhibition in the middle (BA 45), and maintenance for integration (perhaps especially of structured representations) more posterior (BA 44–6) and/or dorsal (BA 46), depending on task demands and capacity.

These domain-general functions interact with content domains. Directed retrieval is likely most often necessary for lexical−semantic and episodic information. Controlled selection (and inhibition) again clearly associates with activated lexical or other memory representations, but activation is also observed in syntactic and phonological tasks for which selection is relevant (e.g. Gold *et al*., 2005; Badre & Wagner, 2007). And maintenance for integration of structured sequences may be most relevant for syntactic and phonological representations, but also for structured sequences in other domains (Petersson *et al*., 2012). That is, the appearance of domain-specific effects in LIFG may result from the relatively greater association of those domains with specific control functions rather than from domain specificity per se.

8.4.2 Functions of posterior language areas

The posterior part of the language network includes the temporal lobe and inferior parts of the posterior parietal cortex. Speech perception involves the primary auditory cortex in Heschl's gyrus and auditory association cortex in surrounding tissue in superior and middle temporal gyri (Price, 2009). This audio channel interacts with motor representations along the posterior frontal cortex, creating what Vigneau and colleagues (2006) call an elementary audio–motor loop that is active during both speech perception and production. This means that we can monitor what we are saying through auditory feedback, and also internally, prior to articulatory encoding (Indefrey & Levelt, 2004; Özdemir *et al*., 2007).

Beyond the auditory processing system, the posterior language network stores, activates and integrates phonological, morphosyntactic and semantic information. Activation here normally spreads automatically and quickly (Pulvermüller, 2012). For example, time-course studies show that initial processing of phonological, semantic, lexical and syntactic information word by word is very fast, happening within about a quarter of a second from the point at which a word can be recognised (Pullvermüller *et al*., 2009). Processing for speech production is at least as fast (Yuan *et al*., 2006). It differs in direction in that activation is from conceptualisation to articulation, but the systems recruited are otherwise similar (Segaert *et al*., 2012). For comprehension, processing from about 400 milliseconds on reflects semantic, episodic and inferential integration of the linguistically preprocessed stream into coherent discourse. For instance, Chillwa and Kolk (2005) show that speakers access script knowledge from three word prompts (e.g. *move*, *piano*, *backache*) about 400 milliseconds after stimulus presentation. Priming studies also show that factors such as frequency, age of acquisition, and likelihood of co-occurrence (collocational probabilities) speed processing (Kandhadai & Federmeier, 2010). These factors strengthen neuronal representations and connections, making for dense networks that process linguistic information automatically (Pulvermüller, 2012). Moreover, at least for the left hemisphere, collocational probabilities, rather than category membership, influence response times. So *dog* will significantly prime *cat* (within-category associates/collocates), *walk* and *bark* (collocates/associates), but not *elephant* or *donkey* (unassociated category members) (Deacon *et al*., 2004). One result is that selection in posterior cortex will tend towards default or canonical terms in so far as more frequent, early acquired, and more closely associated terms are more likely to be strongly activated and hence 'selected'. A second is that fast processing in the left hemisphere occurs partly because it relies extensively on dense networks that are particularly adapted to using current information to predict upcoming information (Kandhadai & Federmeier, 2010).

Shifting from how selection may happen to neural representations of what is selected, there is some evidence for category-like clustering of semantic representations in the left hemisphere. These semantic clusters appear to be distributed in neural tissue according to their features and/or mode of acquisition. For example, in a meta-analysis of imaging studies of (linguistic) semantics, Binder and colleagues (2009) identify category-specific effects for manipulable artefacts in the left lateral temporal−occipital junction, an area associated with access to visual representations (Vigneau *et al*., 2006) and in the left ventral supramarginal gyrus, a heteromodal area for representations of (especially learned skilled) actions and sequences (Grésez & Decety, 2001). Action knowledge activations clustered in similar areas. They also found a contrast between perceptually based, 'concrete' concepts and 'verbal' concepts (abstract concepts like 'categorisation' acquired through language). Concrete concept activations converged on the angular gyrus bilaterally, the left mid-fusiform gyrus, and frontal areas. While frontal activations are likely control effects, the fusiform area is associated with visual representations like shape and colour (Price & Devlin, 2003). Binder and colleagues attribute angular gyrus activity to transmodal integration of semantic information. In contrast, activity for abstract concepts converged on anterior LIFG and cortex along the anterior superior temporal sulcus, the latter area suggesting that concepts which are acquired exclusively through language may be represented near the stream associated with their acquisition. Damasio and colleagues (2004) report similar category-specific effects in their studies of aphasic patients.

Lesion and imaging studies also indicate that the middle temporal gyrus (BA 21) is central for accessing lexical representations (Dronkers *et al*., 2004; Schwartz *et al*., 2009; Vigneau *et al*., 2006). That is, assuming a model like Levelt's where word production involves an initial perspective taking, conceptual activation and selection, lemma selection, and subsequent phonological and articulatory encoding, the middle temporal gyrus appears to be especially involved at the lemma selection stage (Levelt, 1999; Indefrey & Levelt, 2000, 2004). This area is normally co-activated with prefrontal pars triangularis (BA 45) associated with controlled selection and inhibition.

Importantly, the patterns of activation and deficit on lexical−semantic categories do not suggest clustering in neural areas by hierarchically ordered taxonomies. Instead, activations are distributed, and clustering of category members appears to relate to features like visual, motion or action properties that are modally specific to the cluster, or associated with acquisition and use. There is also little evidence of metafunctionally based system networks in temporal or parietal areas. This does not necessarily mean that there is not any metafunctional distribution. For example, one might predict that representations for words associated with interpersonal and textual metafunctions (such as evaluative adjectives and modal verbs, or logical operators and pronouns) might

cluster along the anterior superior temporal sulcus together with other 'verbal' concepts since they share the acquisition pattern. And while this would mean they cluster together, and perhaps distinctly from many experientially based concepts, this would predominantly result from modality and acquisition based feature associations not transparently related to the metafunctional organisation of linguistic systems.

8.4.3 Discourse processing

Studies of discourse processing have yielded three very robust findings. Discourse processing is normally bilateral; it engages not only language networks but also memory and affect networks and the circuits involved in executive control of action, affect and cognition. One study illustrating all these points was undertaken by Xu and colleagues (2005). They developed a set of reading materials using Aesop's *Fables*. They modified all the stories so that lexical items were in the same frequency range and then divided them into a random list of words, an unordered list of sentences, and three coherent stories. Participants simply read the texts (words, sentences, stories) in the scanner. The word list activated a mostly left-lateralised network associated with controlled selection/inhibition (BA 45) of lexis (inferior and middle temporal gyri) and (perhaps) silent articulatory representation (premotor BA 6). In the sentence list, activations in the premotor cortex were bilateral. Activation for selection/inhibition (BA 45) was larger, and adjacent frontal areas associated with manipulation and maintenance were activated bilaterally. Posterior activations also increased, including anterior portions of the middle temporal gyrus and pole bilaterally, left posterior middle temporal gyrus extending to the angular gyrus, and a motor circuit. In the narrative condition, the same sentence processing networks were activated more extensively. Additionally, there was bilateral activation of all of the IFG and executive control circuits, including their basal ganglia−thalamic components as well as a bilateral attention network, and left episodic memory (parahippocampal gyrus) and emotion (amygdal) areas.

The finding that discourse processing is normally bilateral is not novel to this study. Studies of patients with right hemisphere lesions who show comprehension deficits for discourse features such as metaphor and irony point to this (Johns *et al*., 2008). Moreover, in a meta-analysis, Ferstl and colleagues (2008) make the point that bilateral activation of the anterior temporal poles is the most consistent observation in functional imaging studies investigating sentence and discourse processing. The temporal poles are connected directly via the uncinate fasciculus with anterior IFG cortex associated with controlled retrieval (Catani *et al*., 2005). Collectively, these facts suggest that the role of the anterior temporal poles in discourse processing is to integrate episodic and

affect information with linguistic information, building these into the developing discourse representation (see Olsen *et al*., 2007, for affect integration).

Finding activation for attentional and control networks in discourse processing is also not novel. Studies of ambiguity resolution, coherence, theory of mind, inferencing, and referential processing all show activations with similarities to these (Chan *et al*., 2004; Ferstl & von Cramon, 2002; Kuperberg *et al*., 2006; Nieuwland *et al*., 2007). Such consistent findings of activation of networks which in other settings are associated with cognitive control lead to the conclusion that discourse processing relies on the extended language network and on the networks for the executive control of action, affect and memory. Importantly, Xu and colleagues (2005) show that these control networks are active when no specific task (beyond reading comprehension) and no 'problem' stimuli are presented. That is, control and bilateral activation do not occur only in the context of incoherent, ambiguous or otherwise difficult processing. They are normal parts of discourse processing.

8.5 Agency, language and choice

If we return to the key features of SFL models presented in the introduction and relate them to the information on the neural connectivity and activation patterns for language processing, four main points emerge.

First, 'choice' (selection) is ubiquitous in observed activation patterns. Within the perisylvian network, prefrontal pars triangularis (BA 45) associated with controlled selection is commonly engaged on language tasks and co-activates with middle temporal gyrus (BA 21) associated with lemma selection. The extended arcuate fasciculus bundle might provide connectivity for this co-activation. Notably, activation of BA 45 may be present in passive tasks ranging from reading unordered lists of words or sentences to discourse comprehension, and the extent of activation increases (and may become bilateral) depending on the complexity or difficulty of the task (Xu *et al*., 2005). This area and adjacent IFG areas (BA 44, 47) also activates in word production where it is associated with controlled selection/retrieval of words to either semantic or phonological cues (Gold *et al*., 2005).

Second, discourse comprehension tasks normally show activations bilaterally in the extended language network, episodic memory and affect networks, and in the control networks supported by the frontal−basal ganglia−thalamic circuits. Most saliently with respect to choice in discourse, circuits associated with action selection and (affective) decision-making (orbitofrontal/ventromedial PFC), and response selection/inhibition (BA 45), as well as with information maintenance, attention, error monitoring, and initiation are activated in discourse comprehension studies, and in tasks that tap into aspects of discourse

processing, such as ambiguity resolution, inferencing, and establishing cohesive reference. Co-activation of control networks with language, memory and affect networks suggests that we need to take very seriously the idea that discourse is action; that it involves not only activation, selection and inhibition in language areas, but also activation, selection, constant monitoring and potential inhibition in action and affect systems. And while we have seen that for simple motor actions, activations associated with selection are not conscious, the output of selection does become conscious prior to activation of motor programmes. Similarly, in speech we do not have conscious access to activations that lead to speech, but we do have access to our discourse through pre-articulatory phonological representations available to working memory and through auditory feedback, relevant to immediate inhibition or repair. Moreover, if arguments about the rostral−caudal organisation of frontal control networks turn out to be good characterisations of their functional organisation, we should expect that choices that relate to extended text production goals will preferentially activate control networks. For example, discourse planning that involves, say, deciding what sort of speech act or schema to use should recruit anterior lateral and medial PFC in interaction with language and memory networks. This does not mean that there may be a special 'discourse planner' network, but that activities like discourse planning rely on the same domain-general large-scale functional networks as other sorts of prospective thinking. Finally, control circuits also allow for deferred choices – conscious long-term planning, decision-making, and evaluating – and the default mode network supports musing about experiences, interactions, and the feelings they engender. Both kinds of conscious experience may influence the selection and inhibition of subsequent actions/discourse.

Third, while selection and inhibition in language and action are ubiquitous processes that suggest the SFL organisation around choice may be appropriate for setting up processing models, there are aspects of the way SFL models represent choice that may not be well adapted for processing. One of these is the use of hierarchically structured system networks. Systems that present options from superordinate categories through to optimally delicate selections, while wonderful for displaying related data and excellent for computational implementations, do not look like good matches for neural processing models. For example, the evidence for neural representations of nouns or verbs rather robustly suggests that their semantic subclasses may be represented and/or accessed in quite different areas, depending on their features. This is not to say that the contrasts between, say, cognition and action verbs are not meaningful, but that these categories do not appear to cluster together in neural tissue in ways that suggest processing involves choosing 'process' with activation, then spreading to another array of options from which one selects 'cognition' or 'action', and so on until the desired lexical item is arrived at. Nouns present

similar problems. Granted, SFL systems and models were not developed as representations of neurally likely processes. Nevertheless, if we are interested in what happens in us when we talk, figuring out how selection/inhibition operates as we talk and modifying our representations accordingly is worthwhile.

As a starting point, imagine that prior to saying things we may actually formulate plans about what we are going to say, and at least sometimes how we want to say it. We might predict activity in the large-scale control networks in interaction with semantic and memory systems that specify goals in relation to contexts. We might also expect that once goals are set, they function as top-down control on activations in language areas, enabling some of the very fast access characteristic of ordinary speaking. That is, discourse goals may allow direct retrieval and selection of relevant lexical−conceptual items (or small clusters of associates) and structural configurations fairly automatically, at least until things go wrong or get difficult. The fact that the left hemisphere is especially sensitive to frequency and collocational probabilities means that these will also constrain activation patterns and limit selections available at any particular 'choice point'. This too should increase apparent automaticity. However, even in relatively undemanding tasks, in healthy people there is ongoing monitoring of production (like a program that runs in the background), so that we can select, inhibit or repair our discourse as we produce it.

Fourth, and last in terms of key points, the imaging and lesion literature do suggest partial support for the metafunctional hypothesis with the caveat that there is very little evidence for overt metafunctional segregation within the extended language network. Rather, there are patterns of activation in language, control, memory and affect circuits that relate to some metafunctional values. For instance, linguistic stimuli (words, discourses) with affective connotations (negative or positive) activate the medial frontal circuits and associated limbic areas. They also increase activations in inferior frontal gyrus (BA 45, 47) and temporal lobe areas variably, depending on other features of the stimuli. Similarly, there are fairly consistent activation patterns in dorsolateral and medial frontal circuits as well as memory and posterior parietal areas associated with processing for cohesion and coherence. However, the overlap in activations on different tasks again suggests that very basic executive functions such as selection/inhibition, monitoring and error-detection supported by the frontal circuits are actively engaged in whatever stimuli are presented for directed attention. Beyond these patterns, we should expect that 'core' areas of the interpersonal metafunction, such as the selection of speech functions, might activate the medial frontal circuit in the control network that would then drive the activation and selection of relevant structures in the extended language network (hypothetically, in the anterior superior temporal lobe). That is, some of our key meaning choices may originate in action selections 'outside' language areas, as suggested for instance in Halliday's proposal that speech function

selections originate in prior action selections. While this is speculative, it does suggest a research programme for investigating choice in a neurocognitive perspective.

I began with observations about the twin paradoxes of 'unconscious choice' and 'the unintentional agent' as, to my mind, problematic in a model of language that is about language use. Through selective review of the literature on executive control processes, and the neuroimaging and lesion literature on choice in language and discourse, I have tried to set a frame in which it is possible to imagine a speaker who is an agent, not only capable of, but continuously making, conscious choices in discourse. This speaker-as-agent also carries out a great many activities with limited attention, relying on highly automated activations and selection-by-default for routine activities. S/he makes coffee in the morning without thinking about the sequences of actions necessary for the task. S/he talks without hesitating before each word to see if it fits the current syntactic frame or carries appropriate connotations. And this speaker-as-agent is certainly not consciously aware of the neurophysiological processes enabling this activity. However, if s/he is well, s/he is continuously monitoring these activities. S/he can inhibit an action, choose chocolate instead of coffee, plan to talk about an idea later and do so. The neural systems that support the ongoing monitoring, selection, inhibition and execution of action are the same ones that, in interaction with language, affect and memory networks, allow us to be agents of our discourse.

9 A neurocognitive interpretation of systemic functional choice

José María Gil

9.1 Introduction

In the third edition of *An Introduction to Functional Grammar*, Halliday and Matthiessen write that each system (or "moment of choice") contributes to the formation of structure.[1] They do not suggest that there is conscious choice here, because those "moments" are analytic steps in the grammar construal of meaning. But they do affirm that the "relation between semantic choice and what goes on in the brain" (Halliday & Matthiessen, 2004:24) will be found in the book *Pathways of the Brain*, published by Sydney Lamb in 1999.

In a suggestively complementary way, Lamb (2006:208) proposes that it is likely that the work on discourse analysis by Halliday can be accepted as scientifically valid "as it reflects a concern for reality and is based on conceptions that can be accommodated into the neurocognitive conception".

Since the compatibility of Systemic Functional Linguistics and Neurocognitive Linguistics has been widely accepted, the purposes of this chapter are to show *how* the two theories and their notational devices are related to each other, and to determine *how* neurocognitive relational networks contribute to understanding what systemic choice is and what it involves.

Within Systemic Functional Linguistics, a 'system' is a set of eligible members: "a set of things of which one must be chosen", in Alick Henrici's words (Halliday, this volume). Thus, 'choice' can be defined both as the potential and the concrete selection of some member of a system. Specifically, choices are represented in systemic networks, and also in analyses of the structures of clauses. In fact, analyses of the structure of clauses account for concrete choices, i.e. the elements that are part of certain systems and have been chosen in concrete syntagmas. There are of course many other accounts of concrete-syntagmatic choices, for example discursive analyses of cohesive ties (Halliday & Hasan, 1976).

[1] This work was mainly elaborated in Rice University (Houston, Texas), and it was supported by a Fulbright-CONICET postdoctoral grant. I give hearty thanks to Sydney Lamb for his indispensable help, comments, and general supervision.

In summary, when analysing the structure of a single clause, we are accounting for concrete choices, i.e. the elements chosen within the syntagmatic dimension; when providing systemic networks, we are talking about potential choices, within the paradigmatic dimension.

The very idea of 'choice' is involved in Hallidayan systems. For example, Transitivity, Mood and Theme are systems (in the technical sense used by Halliday), because they are salient examples of 'choice', i.e. sets whose members are candidates to be selected under certain circumstances. In addition, Transitivity, Mood and Theme are systems (sets of options) by means of which three metafunctions are present in the structure of clauses; the reason for that is that ideational, interpersonal and textual meanings determine choices at the lexicogrammatical level. In fact, one single clause will always be an instance of choice, where the three systems of Transitivity, Mood and Theme will be represented.

Neurocognitive Linguistics can easily accept, for example, that every clause in every text is multifunctional, as it accepts many descriptions provided by articulatory and acoustic phonetics. Within this theoretical framework, the account of the simultaneous presence of Transivity, Mood and Theme (and their corresponding metafunctions: ideational, interpersonal, textual) can be interpreted as a realistic characterisation of the products of linguistic behaviour. But it will be argued here that Neurocognitive Linguistics offers some complementary benefits:

- Symbols are not included in neurocognitive relational networks, which therefore demonstrate that the linguistic system is purely a network of relations, containing no symbols at all.
- Neurocognitive relational networks, which have been shown to be neurologically plausible, depict parts of the actual linguistic system of the individual who produces and understands the choices represented in the structure of a single clause.

In fact, symbols are essential in systemic functional networks, as they are used to account for lexicogrammatical and semantic structure. In contrast, symbols are not part of relational networks. Systemic networks will be converted using relational network notation, but this conversion does not imply that the former will be able to claim operational plausibility, a fundamental requisite for the latter.

In summary, representations of potential paradigmatic choices embodied in systemic networks, and concrete syntagmatic choices analysed in clause structures, can be considered as realistic depictions of the products of speakers' behaviours (i.e. texts), whereas neurocognitive relational networks count as descriptions of the actual physical systems which make such products possible.

In passing, the use of the same lexeme, *system*, to make reference to a 'functional set of options' or to a 'representation of linguistic information'

should not be problematic at all; the term *system* can be used to evoke these two different meanings, and many other meanings too.

Having assumed that there is a strong correspondence between the works of Halliday and Lamb, and with a specific view to explaining *how* the two theories and their notational systems are related, this chapter will be organised into the following two sections:

9.2 A neurocognitive interpretation of systemic functional networks. The 'remote' origins of the harmonic relationship between the two theories can be found in the 1960s, when Sydney Lamb (1966) elaborated his notation for Stratificational Grammar after Michael Halliday shared with him the notation for systemic networks. Since there is indeed a powerful historical and theoretical link between Halliday's systemic networks and Lamb's relational networks, it would not be unreasonable to presuppose that, to some extent, the two notational systems manifest important equivalences. However, after comparing them, a set of remarkable differences between systemic and relational networks will be considered. While notationally similar, the two systems are being used for quite different purposes.

9.3 Is systemic functional theory realistic? Systemic Functional Linguistics has provided extensive accounts of choice in text production. Those accounts can be translated into relational networks, which are compatible with neurological structures (Lamb, 1999, 2004a, 2004b, 2005, 2006, 2010). However, the results of such translation cannot be considered, in principle, neurocognitively valid, because they lack operational plausibility (see also Lamb, this volume). It will be reasonable to suggest, therefore, that Systemic Functional Linguistics is a realistic analytical theory which could provide realistic data for the construction of operationally and neurologically plausible accounts.

9.2 A neurocognitive interpretation of systemic functional networks

In the 1960s, Halliday proposed his 'systemic' description, in which the grammar takes the form of a series of 'system networks' (Halliday, 1963a, 1963b, 1964, 1967a, 1967b, 1976d). Each such network represents the choices associated with a given constituent type, for example 'clause system network'. The importance of systemic networks for relational network theory has been mentioned at various times. For instance, Lamb (2004e:33) writes that "with two or three simple modifications to Halliday's network notation", he had the essentials of relational network notation.

Lamb (this volume) illustrates how, with a few simple changes, systemic networks can be converted into relational networks. The relatively straightforward adaptations that are exposed in these translations cannot be used to explain how systemic networks are different from what relational networks attempt to depict.

In order to account for a neurocognitive interpretation of systemic functional networks, this first part of this section will be divided into two subsections:

9.2.1 Transitivity and Mood system networks in terms of neurocognitive relational networks. It will be shown how two representative examples of systemic networks (which include symbols as part of their structures) can be converted into neurocognitive relational networks. Concretely, the system networks of Transitivity and Mood will be interpreted in terms of relational networks.

9.2.2 Fundamental differences between systemic functional networks and neurocognitive relational networks. Previous comparisons and translations will shed light not only on the important differences between the two notational devices, but also on the differences between the two underlying theories.

9.2.1 Transitivity and Mood system networks in terms of neurocognitive relational networks

The ideational, interpersonal and textual metafunctions are represented in the grammatical structure of the clause, respectively, by the following systems: Transitivity, Mood and Theme. As Robin Fawcett (2008) suggests, this principle introduced by Halliday is a cornerstone of Systemic Functional Linguistics, and it could be called the 'multifunctional principle of language': every clause serves several different functions at the same time. Every clause of every text is, in this special sense, 'multifunctional'. Three of these meanings are ideational, interpersonal and thematic, though there could be others, and this multifunctional principle should not apply just to English, but to all natural human languages. It will be shown here *how* the system networks of Transitivity and Mood can be converted into neurocognitive relational networks, the two of them, together with Theme, being fundamental constituents of clause structure (Lamb, this volume, accounts for a relational interpretation of Theme).

9.2.1.1 Transitivity and ideational metafunction

The linguistic system serves for the expression of the individual's experience of the world, including the inner world of his own consciousness: this is, roughly, the ideational metafunction of language, which represents our experience of the processes, persons, objects, abstractions, qualities, states and relations of the world, both around us and inside us (Halliday, 1970:145). It is well known that Halliday prefers the term 'metafunctions' rather than 'functions'. The reason for that is that the term *functions* has traditionally made reference only to general types of language use, for example the 'functions of language' described by Jakobson (1960): 'referential function', 'poetic function', 'phatic function', etc. On the other hand, within Systemic Functional Linguistics, the wider concept 'metafunction' means that language functions are not only general types of language use, but also fundamental components of the linguistic system and the bases of all grammatical phenomena.

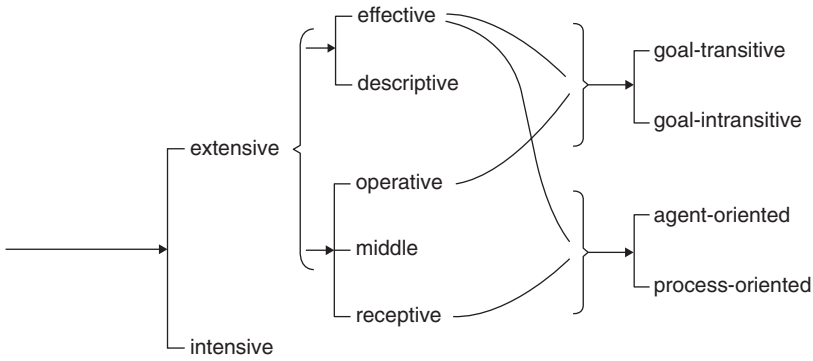

Figure 9.1. The system network of extensive and intensive clauses (Halliday, 1967a:47)

We have, therefore, a direct relation between language use and language structure. For example, Transitivity is the grammatical system (the grammatical set of choices) which serves to express ideational meaning within the clause. Notational conventions for systemic networks have been implemented in many accounts of linguistic structure. For instance, Figure 9.1 depicts the last systemic network presented by Halliday in the first part of his fundamental work 'Notes on Transitivity and Theme in English' (1967a:47). This rather old figure is a precious example of the conception of choice that has been preserved in systemic functional tradition.

The system network represented in Figure 9.1 includes the following grammatical features of the clause:

- *extensive*: clause with 'action' process type;
- *effective*: clause with 'directed action' process type;
- *descriptive*: clause with 'non-directed action' process type;
- *operative*: clause with 'directed action' process type, Subject as Actor;
- *middle*: clause with 'action' process type, with "only one inherent participant" (Halliday, 1970:151);
- *receptive*: clause with 'directed action' process type, Subject as Goal;
- *intensive*: clause with 'ascription' process type.

Halliday provides examples of the nine resulting types of clause, listing them in the order in which they were introduced, and giving a unique description in term of features. The full systemic descriptions are rewritten with the ordering of their features in Table 9.1. In the fourth column, ':' indicates hierarchy, '/' indicates simultaneity, and 'I_1' indicates an intersection. In example (i), the selection of 'goal-transitive' depends on the intersection of *effective* and *operative*. Structural realisations are provided in the second line of the fourth column.

Table 9.1. *Full systemic descriptions with ordering of features in extensive and intensive clauses*

Example		Features	Full systemic descriptions, and ordering of the features
(i)	She washed the clothes	Effective, operative, goal-transitive	{extensive : {effective : I_1, goal-transitive / operative : I_1}} SUBJECT ergative-PREDICATE2, active-COMPLEMENT ext
(ii)	The clothes were washed	Effective, receptive, agent-oriented	{extensive : {effective : I_2, agent-oriented / receptive : I_2}} SUBJECT accusative-PREDICATE2, passive
(iii)	The prisoners marched	Descriptive, middle	{extensive : {descriptive / middle}} SUBJECT nominative-PREDICATE1, active
(iv)	She seemed happy	Intensive	{intensive} SUBJECT attribuant PREDICATE0, act-COMPLEMENT int
(v)	He marched the prisoners	Descriptive, operative	{extensive : {descriptive / operative}} SUBJECT ergative-PREDICATE1, active-COMPLEMENT ext
(vi)	The prisoners were marched	Descriptive, receptive	{extensive : {descriptive / receptive}} SUBJECT accusative-PREDICATE1, passive
(vii)	She washed [herself]	Effective, middle	{extensive : {effective / middle}} SUBJECT nominative-PREDICATE2, active
(viii)	She washed [the clothes]	Effective, operative, goal-intransitive	{extensive :{effective : I_3, goal-intransitive / operative : I_3}} SUBJECT ergative-PREDICATE2, active
(ix)	The clothes washed	Effective, receptive, process-oriented	{extensive : {effective : I_4, process-oriented / receptive : I_4}} SUBJECT accusative-PREDICATE2, active

It is apparent that the system network represented in Figure 9.1 is based (among other valuable information) on the complex symbolic description that has been represented in Table 9.1. I shall argue that the information represented in Figure 9.1 can be converted into (pure) relationships. With a view to making such a conversion, we can make use of the equivalences shown by Lamb (this volume). And if we do make use of such equivalences, the information, which is based on symbols in Figure 9.1, can be converted into relationships: There is a first attempt represented in Figure 9.2. Marked options have been adapted

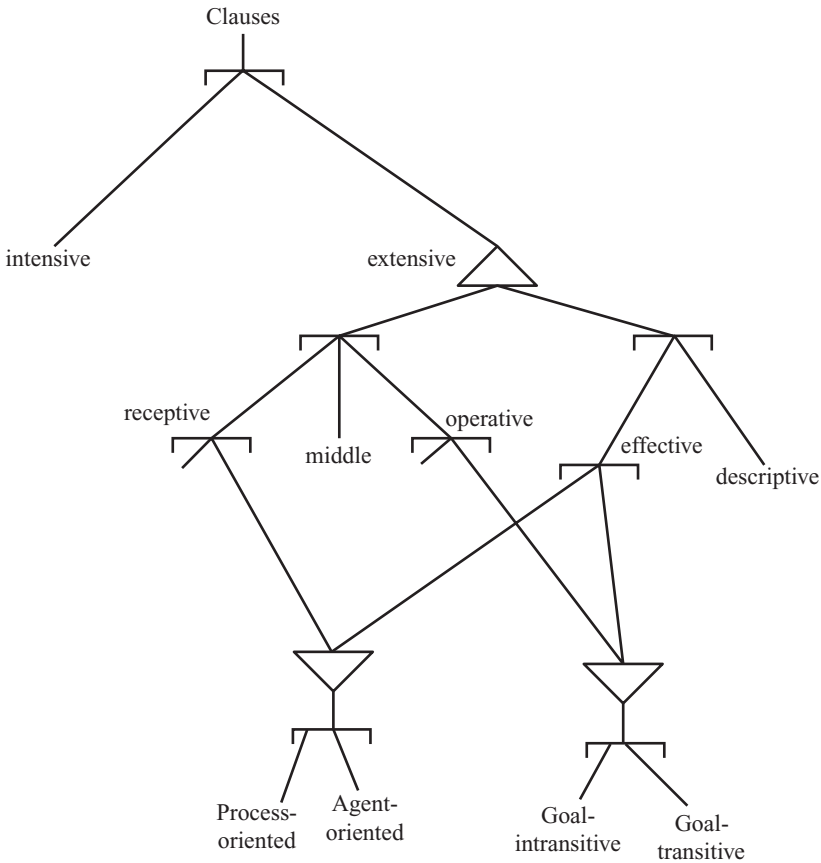

Figure 9.2. The system network of extensive and intensive clauses in relational terms

as precedent options in DOWNWARD ORDERED OR nodes, precisely because they are non-default options. On the other hand, unmarked choices have been 'translated' as default options in DOWNWARD ORDERED OR nodes. Such important factors like marked and unmarked options in systemic functional networks have to be represented by symbols, this being one of several substantive differences between systemic and relational networks. The symbols used in Figure 9.1 (like *extensive* or *intensive*) are part of the linguistic structure which is being depicted. On the other hand, symbols are not constituents of relational networks, because they are purely relational. For example, the inscriptions used in Figure 9.2 have to be interpreted as labels, which help us to understand this diagram.

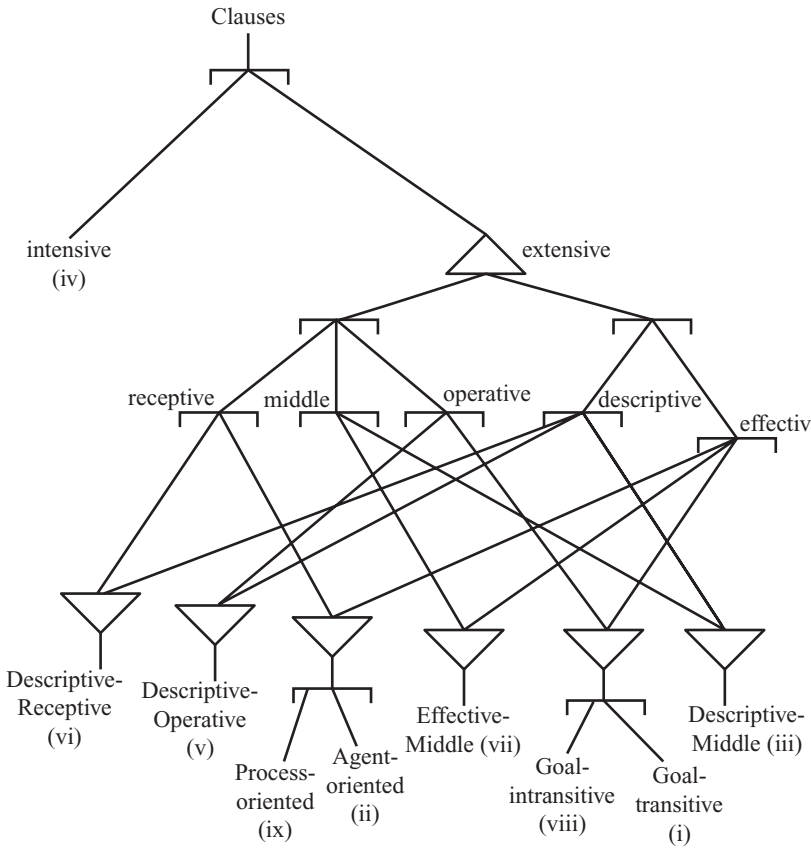

Figure 9.3. The system network of extensive and intensive clauses in relational terms (more information)

Figures 9.2 to 9.7 will show how the notational system that has been developed within relational network theory aims at accounting for the crucial fact that the linguistic system *is* a network of relationships. Every single network is composed of nodes with interconnecting lines.

Figure 9.3 includes some additional and relevant information which has not been depicted in Figures 9.1 and 9.2, but which has been made explicit in Table 9.1, namely the nine different types of extensive and intensive clauses.

It must be emphasised that the first attempts represented in Figures 9.2 and 9.3 do not consider highly crucial information such as those semantic factors which determine choices at the lexicogrammatical level. Labels for such meanings are written in capital letters in Figure 9.4. For example, if the

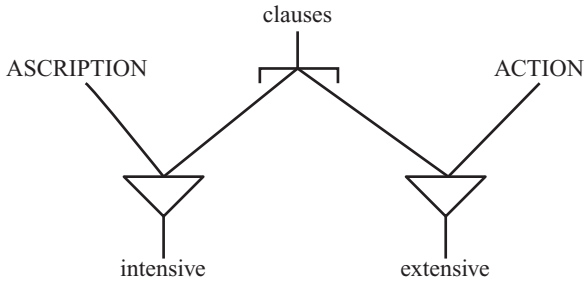

Figure 9.4. Meanings which determine choices at the lexicogrammatical level

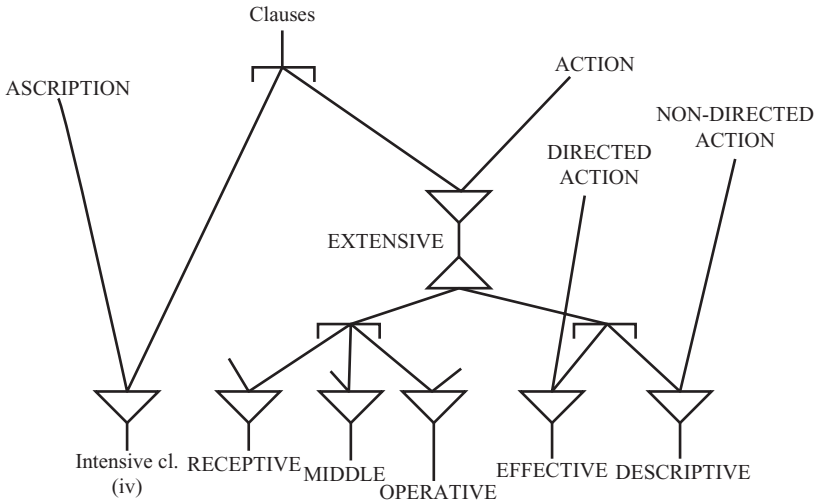

Figure 9.5. A more complex interaction between meanings which determine choices at the lexicogrammatical level

speaker needs to express ASCRIPTION s/he will opt for an intensive clause; if s/he needs to express ACTION, then an extensive clause will be the selected option.

Now, Figure 9.5 aims at representing a more complex interaction between several semantic factors, whose labels are again written in capital letters. For example, the choice of EFFECTIVE is determined by DIRECTED ACTION, whereas the choice of DESCRIPTIVE is determined by NON-DIRECTED ACTION. (Open connections for RECEPTIVE, MIDDLE and OPERATIVE will be made explicit in Figures 9.6 and 9.7).

Our next diagram, Figure 9.6, depicts more precisely how the system network of extensive and intensive clauses of Figure 9.5 can be converted into pure

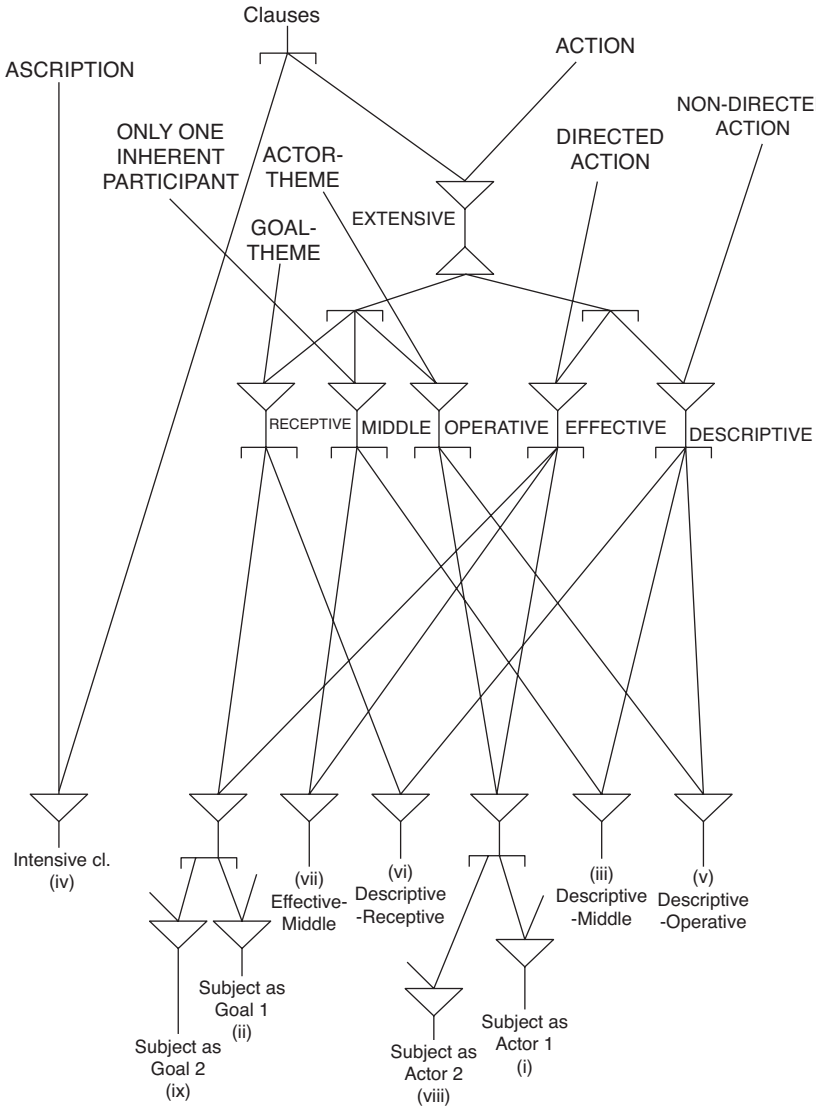

Figure 9.6. The system network of extensive and intensive clauses converted into relationships

relationships. Labels for semantic factors (written in capital letters) help us to show how such semantic factors determine choices at the lexicogrammatical level. For example, an instance of clause type (i), such as *She washed the clothes* [Subject as Actor], is determined by OPERATIVE and EFFECTIVE, which (in their turn) are determined respectively by ACTOR-THEME and DIRECTED ACTION.

Finally, Figure 9.7 represents more information than Figure 9.6. For example, it shows how the choice of an instance of clause type (i) is also determined by GOAL TRANSITIVE. In fact, Figure 9.7 includes all the information that is involved in Halliday's Figure 9.1 and Table 9.1, which form together a systemic functional account of extensive and intensive clauses.

In conclusion, it seems that the conversion represented in Figure 9.7 allows us to begin to see how systemic network notation and relational network notations are related.

It should be stated here that Figure 9.7 must not be interpreted as the set of actual choices that a speaker needs to make in the process of forming an utterance: it is just a translation of Halliday's classification shown in Figure 9.1.

Figure 9.7 does have the shape of a relational network. However, it is not a relational network that would be drawn in Neurocognitive Linguistics, because it does not represent the way a clause would be formed or understood; in other words, Figure 9.7 does not aim at reaching operational plausibility. For example, a speaker does not start to form an utterance activating a concept such as ASCRIPTION, PROCESS ORIENTED OR ONLY ONE INHERENT PARTICIPANT. These labels are semantic categories of a systemic functional analysis: it has never been suggested that they are constituents of the cognitive systems of language users.

9.2.1.2 Mood and interpersonal metafunction

Figure 9.8 reproduces "the full range of options in MOOD" (Halliday & Matthiessen, 2004:134), including the systems of INDICATIVE and INTERROGATIVE TYPE.

Table 9.2 presents a set of examples which help to characterise the different types of clauses and their constituents relating to Mood and the interpersonal metafunction of language.

The systemic functional network in Figure 9.8 describes a full range of options available for the speakers. A much more delicate description of the MOOD system is also provided by Halliday and Matthiessen (2004:135). But independently of the levels of delicacy, systemic functional networks describe (and maybe also predict) speakers' behaviours. Thus, when elaborating a concrete message, a speaker will have these (and many other) options available. Choices corresponding to interpersonal meaning and Mood tend

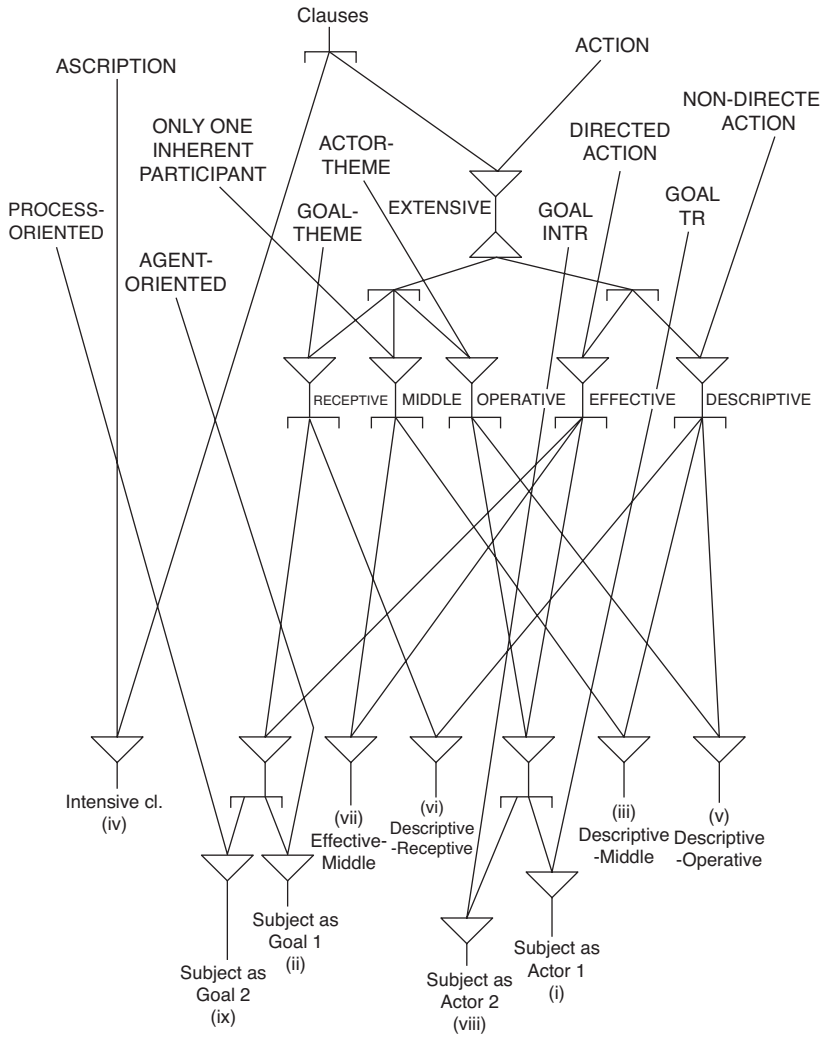

Figure 9.7. The complete system network of extensive and intensive clauses converted into relationships

to be determined by the role relationships in the situation. Some specific social roles are defined in linguistic terms. These are the social roles of the 'second order', which come into being only in and through the linguistic system: the communicative roles of questioner, informer, demander, and the like (Halliday, 1978b:144). The social roles of the 'first order' are prior to language,

Table 9.2. *Some examples of the types of clause and their constituents relating to Mood*

Declarative	*Bruna* Subject Mood	*is* Finite	*cooking* Predicator Residue	*pizza* Complement
Interrogative yes/no	*Is* Finite Mood	*Bruna* Subject	*cooking* Predicator Residue	*pizza* Complement
Interrogative Wh-	*What* Complement Residue	*is* Finite Mood	*Bruna* Subject	*cooking* Predicator Residue
Imperative	*Cook* Predicator	*some pizza* Complement		*Bruna* Vocative
Minor clause	*Hello!* (There is no display of Mood + Residue structure)			

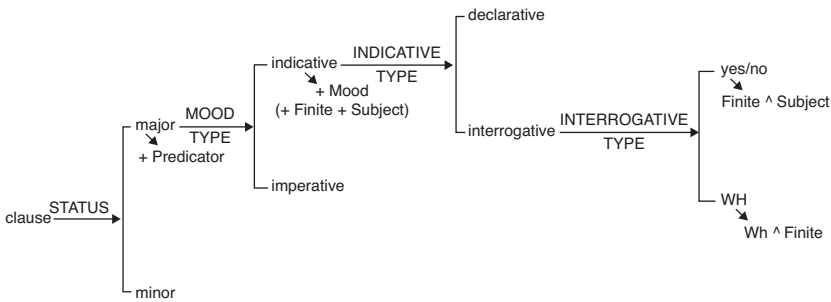

Figure 9.8. The MOOD system network (Halliday & Matthiessen, 2004:23)

for example, father−son, teacher−student, employer−employee, etc. As Butt (2001:1819) says, "choices function to construct text and social order".

Thus the linguistic system serves to establish and maintain social relations. This is, roughly, the interpersonal metafunction (Halliday, 1970:143). By means of it, individuals delimit social groups and identify other individuals. Every particular language incorporates options whereby the speaker can change his or her communicative role, by making assertions, asking, demanding, etc. In English, the basic speech functions such as statement, question and demand are included within this set of options (i.e. within this systemic network), and they are expressed grammatically in the system network of Mood (Figure 9.8). The fundamental lexicogrammatical options are 'declarative', 'interrogative' (yes/no and WH-questions), and 'imperative', and their grammatical differences involve social distinctions in terms of the communicative role adopted

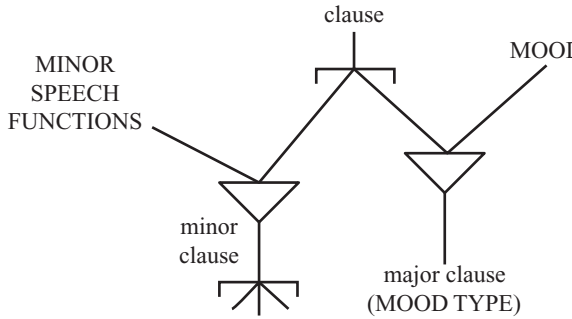

Figure 9.9. Mood into relationships (first part)

by the speaker in the interaction with the hearer. As a systemic network, Figure 9.8 aims at describing a full set of lexicogrammatical and semantic options that enable the speaker to define his or her own role in a verbal exchange, as well as to identify the hearer's role. The much more delicate description provided by Halliday and Matthiessen (2004:135) describes the same full set of options, but with a higher level of detail and precision.

One of the objectives of this chaper is to demonstrate how systemic functional choices represented in systemic networks can be converted into neurocognitive relational networks. Figure 9.8 depicts the basic speech functions (declarative/statement, interrogative/question, imperative/request), and how they together form a complex system of paradigmatic choices:

- Declarative: Subject + Finite
- Interrogative yes/no: Finite + Subject
- Interrogative wh-: Wh- + Finite + Subject
- Imperative: (Subject) + Predicator [Subject is a marked option here]

Now, Figures 9.9–9.13 aim at showing how these four basic types of clause can be accommodated into the neurocognitive conception of relational networks. Concretely, the information that is represented by means of symbols in Figure 9.8 will have been converted into relationships in Figure 9.13. The same conventions regarding labels for meanings and unmarked options (and that have been applied in Figure 9.7) will be applied here.

First of all, Figure 9.9 is a translation of the left side of Figure 9.8: there are two types of clauses, minor and major; the choice of the former is determined by MINOR SPEECH FUNCTIONS, whereas the choice of the latter is determined precisely by the expression of MOOD.

On the basis of Figure 9.9, Figure 9.10 subsumes the class of major clauses. Upward unordered nodes for imperative, declarative, interrogative, etc. will be

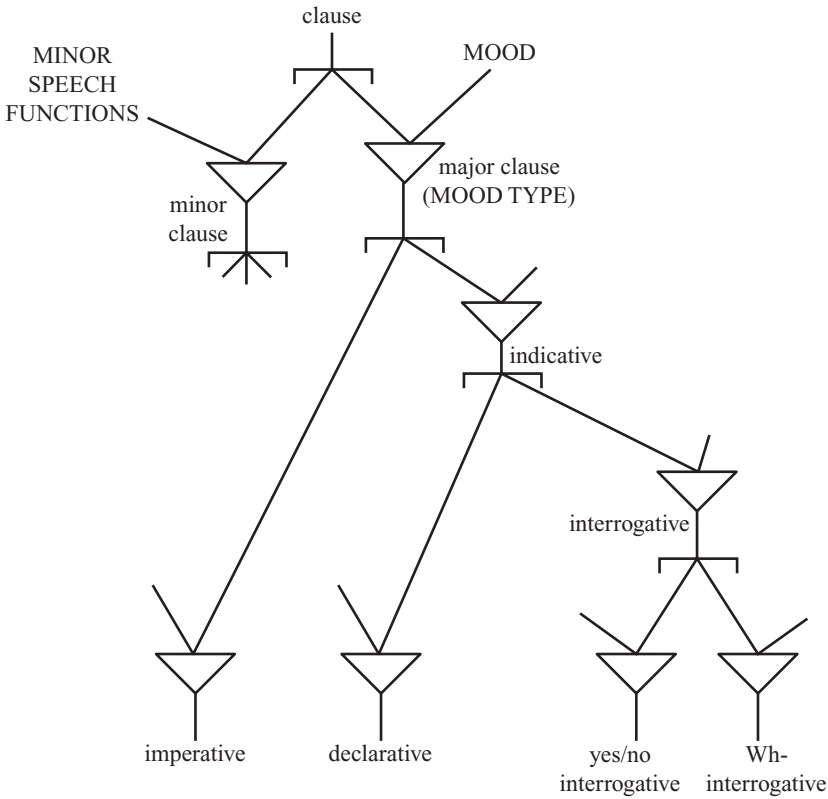

Figure 9.10. Mood into relationships (more information)

connected to semantic nodes making explicit which meanings determine their choices.

Figure 9.11 illustrates how the choice of the different types of clause is determined by semantic factors. For example, 'indicative' is determined by EXCHANGE INFORMATION, whereas DEMAND INFORMATION determines 'interrogative'. Figure 9.11 also helps us to understand why the linguistic system is as it is; its structure is closely related to the demands we make on it, i.e. "the functions it has to serve" (Halliday, 1970:141). For example, the very existence of imperative clauses may be the consequence of a very basic need: the need of DEMANDING GOODS AND SERVICES.

Now, Figure 9.12 provides a relational account of the structure of the different types of clauses. Downward ordered nodes enable us to account for such structures. For example, declarative is integrated by the sequence 'Subject +

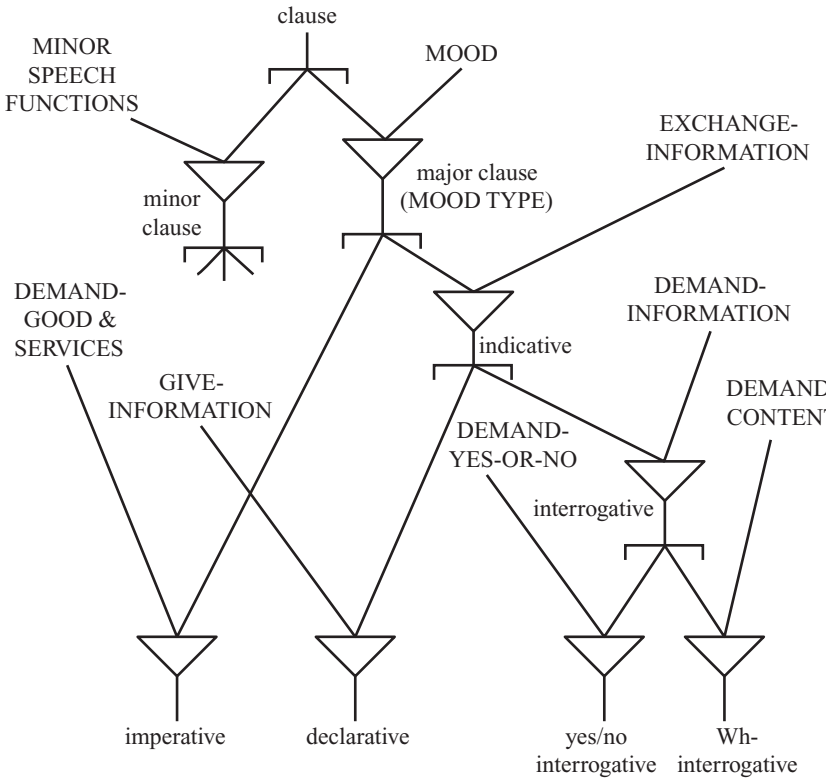

Figure 9.11. Mood into relationships: the choice of a type of clause being determined by semantic factors

Finite + Predicator' (as in *Bruna is blonde*), and yes/no interrogative is integrated by 'Finite + Subject + Predicator' (as in *Is Bruna blonde?*).

Finally, Figure 9.13 combines Figures 9.11 and 9.12, allowing us to provide an account of how the system network of Mood in Figure 9.8 can be interpreted in relational terms.

The interpretation of the system of Theme (Halliday & Matthiessen, 2004:80) in relational terms is also relevant here, and has already been considered by Lamb (2010, this volume).

In conclusion, Figures 9.7 and 9.13 may show how the systemic networks of Figures 9.1 and 9.8 (which include symbols as part of their structures) can be converted into purely relational networks. This allows us to begin to see how the two notational systems are related. Nevertheless, it should be added that Figure 9.13 (like Figure 9.7) does not aim at reaching operational plausibility,

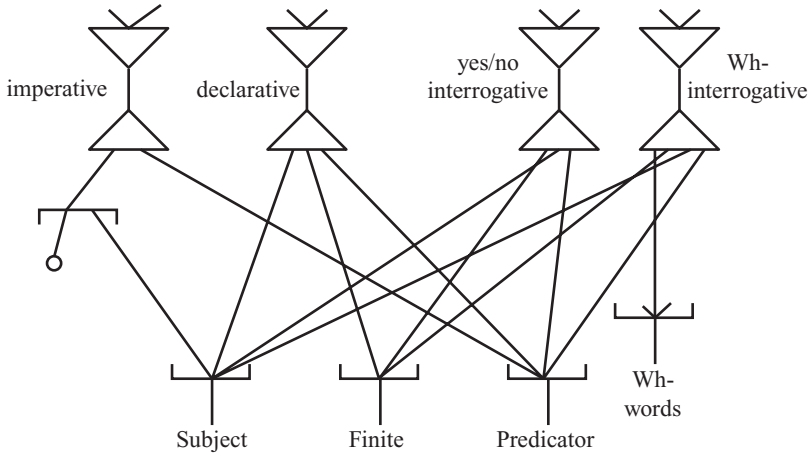

Figure 9.12. The basic speech functions into relationships

and consequently it is not a neurocognitive relational network: an individual does not start to form an utterance by means of the activation of concepts such as ASCRIPTION, MINOR SPEECH FUNCTIONS or MOOD. These concepts are *analytical* categories, because they are used to analyse and account for linguistic productions (Lamb, 1999:9). Section 9.2.2 will account for the main differences between the two types of network.

9.2.2 *Fundamental differences between systemic functional networks and neurocognitive relational networks*

It has already been pointed out that, although they are strongly related, systemic and relational networks account for very different kinds of phenomena. Systemic functional networks categorise the products of speakers' behaviours, constituting a first step towards understanding the actual behaviours; neurocognitive relational networks are concerned with the processes by which texts are constructed. Some subtle but relevant differences between the two underlying theories and their notational systems are listed in Tables 9.3 and 9.4, respectively.

In summary, systemic networks and relational networks are used for two distinct purposes. Systemic networks describe the choices available to users of a language, whereas relational networks are used to represent properties of the neurocognitive system of a language user.

Neurocognitive relational networks are intended to account for any part of the neurocognitive system of an individual, but a complete description is

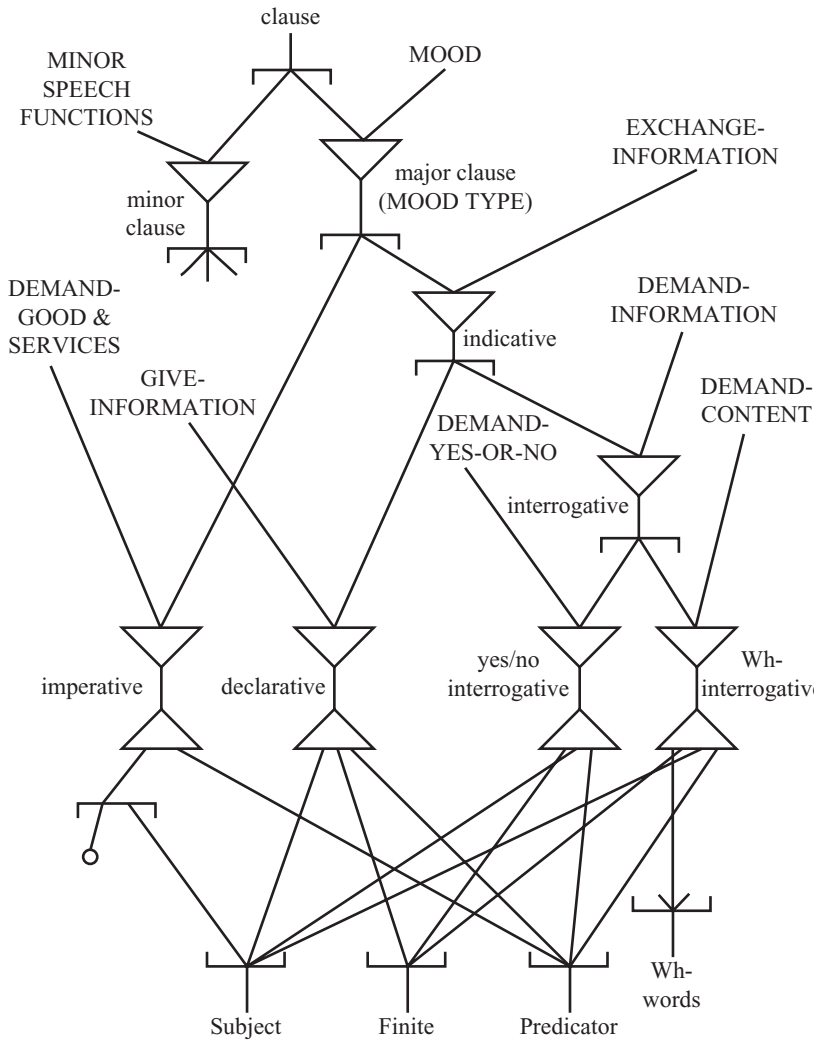

Figure 9.13. The MOOD system in relational network terms

obviously impossible: "No one could ever draw a network that would provide a complete account, even after a lifetime of work" (Lamb, 1999:156). It could be widely accepted that Neurocognitive Linguistics can rely on Systemic Functional Linguistics to provide delicate descriptions of the systems of options available for the speakers and their consequent productions. On the other hand, Systemic Functional Linguistics could rely on Neurocognitive Linguistics to be

Table 9.3. *Fundamental differences between Systemic Functional Linguistics and Neurocognitive Linguistics*

Systemic Functional Linguistics	Neurocognitive Linguistics
Language is conceived as a "social semiotics" (Halliday, 1978b).	The *linguistic system* is a particular brain system richly and strongly connected with other brain systems (Lamb, 1999, 2004b).
Neurological plausibility is widely presupposed, but not demonstrated. It is suggested that Neurocognitive Linguistics accounts for it (Halliday & Matthiessen, 2004).	Neurological plausibility is explicitly stated as one of the requisites of the theory (Lamb, 1999). Nodes and connections are implemented, respectively, as cortical columns and neural fibres (Lamb, 2005).

consistent with neurological evidence and to be interpreted as a fully realistic linguistic theory. Concern about linguistic reality will be precisely the subject of Section 9.3.

9.3 Is systemic functional theory realistic?

Lamb proposes a definite meaning for the term 'realistic' in the context of his neurocognitive research (Lamb, 1999, 2006). A 'realistic' theory of language should go beyond the analysis of the products of verbal behaviour (i.e. texts), and should account for the linguistic system in relation to actual human beings. With a view to doing that, a realistic linguistic theory will have to satisfy the following three requirements (Lamb, 1999:293–294):

1. *Operational plausibility*: A realistic linguistic theory has to provide a plausible account of how the linguistic system can be put into operation in real time to produce and understand speech.
2. *Developmental plausibility*: A realistic linguistic theory needs to be amenable to a plausible account of how the linguistic system can be learned by children.
3. *Neurological plausibility*: A realistic linguistic theory has to be compatible with what is known about the brain from neuroscience.

Robin Melrose (2005) has presented a valuable attempt which aims to demonstrate that the basic principles of Systemic Functional Linguistics are supported by research in neuroscience. However, Melrose's arguments seem to face serious problems. For example, he assumes that certain information provided by neuroscience is true, and he also assumes that certain systemic functional analyses are not only true, but also neurologically plausible. Therefore, such information and analyses can (or must be) reconciled. But this argumentative procedure does not really account for the neurological plausibility of the

Table 9.4. *Some fundamental differences between systemic functional networks and neurocognitive relational networks*

Systemic Functional Networks (SFN)	Neurocognitive Relational Networks (NRN)
SFN are used to represent 'systems', such as Transitivity, Mood and Theme. SFN indicate semantic and lexicogrammatical information, but in symbolic form rather than as network connections.	NRN can be used to represent any relevant part of the actual linguistic and semological systems of a real speaker or hearer ('semology' is the level of 'sememes', i.e. the representations of all categories of thinking and imagining; Lamb, 1999:144). NRN are purely relational: in Hjelmslev's words, they free linguistic science from the metaphysical hypothesis that objects and symbols are something different from relationships (Hjelmslev, 1961).
SFN describe potential paradigmatic choices, i.e. the potential of the linguistic system, a full range of options available for the speakers. SFN provide descriptions, with different levels of delicacy, of potential speaker behaviours.	NRN account for the neurocognitive systems which allow an individual to produce the utterances that are found in texts (and that can be analysed in systemic functional terms).
SFN are mainly speaker-oriented. (Of course, interpretation is taken into account, but system networks, as stated below, describe the set of options available for the speaker.)	NRN are intended to account for both the speaker's and the hearer's linguistic and semological systems.
SFN notation does not separate meanings from wordings. In 'analytical' terms, this is an asset of Systemic Functional Linguistics, because it aims at accounting for the indissoluble relationship between "language structure" and "language use" (Halliday, 1970).	NRN demonstrate a clear distinction between lexicogrammatical and semantic nodes, and exhibit the connections between them. NRN serve to illustrate that the linguistic system of an individual is (as Halliday says) a three-stratum system in which meanings are coded into wordings, and then wordings into expressions.
SFN mainly describe the options available in linguistic production.	NRN account for automatic and parallel processing not only in linguistic production, but also in linguistic comprehension.
In SFN, symbols are a fundamental part of linguistic and semantic structure. For example, symbols are necessary to account for important notions in systemic networks, such as 'marked' and 'unmarked'.	In NRN, symbols are not part of linguistic and semological systems. The inscriptions beside relational networks are just labels. The selection of marked or unmarked choices is straightforwardly represented by DOWNWARD ORDERED OR nodes, together with upward connections to semantic nodes.
In SFN, semantic factors which govern lexicogrammatical choices are accounted for also by means of symbols.	NRN make explicit the semantic information which governs lexicogrammatical choices: semantic nodes lead downwards to lexicogrammatical nodes.

conciliations proposed. In fact, Melrose assumes that the information about neurological evidence and systemic functional analyses are true, but he does not explain *why* systemic functional characterisations of language are neurologically plausible. In addition, the author himself admits that (some of) his proposals are "highly speculative" (Melrose, 2005:419).

To some extent, the neurological plausibility of Systemic Functional Linguistics is presupposed but not demonstrated. In fact, systemic functional linguists do not aim to explain what goes on in the brain. This is, as Halliday and Matthiessen (2004:24) suggest, a work whose development will rely on Neurocognitive Linguistics. We are, then, faced with the following situation:

1. Systemic functional descriptions convincingly account for many linguistic phenomena, including clause structure and the presence of several meanings within the clause.
2. The phenomena described by Systemic Functional Linguistics result from the actual performance of human beings.
3. Humans evidently have such capabilities because of structures in their brains and the processes performed in/by these structures.
4. Therefore, Neurocognitive Linguistics has its work cut out: one of its goals can be to provide neurocognitively realistic hypotheses of how the systemic functional information is represented in relational networks.

On the basis of (4), it seems to be the case that: (i) Systemic Functional Linguistics provides research opportunities for Neurocognitive Linguistics; and (ii) Systemic Functional Linguistics should welcome any successes in such research, because such successes will provide a demonstration of its neurological plausibility.

For now, it is very important to emphasise that Systemic Functional Linguistics is not unrealistic, simply because it can be included in the respectable and valuable group of 'analytical linguistic theories'. An analytical linguistic theory deals with the linguistic productions of people (texts). Thanks to Systemic Functional Linguistics we can understand many aspects of the complex interaction between linguistic structures and linguistic functions. Many of these aspects have been illustrated in this chapter, for example in the representation of the Mood system (and the interpersonal metafunction) within the clause (see Table 9.2).

We can conclude that a linguistic theory is unrealistic if it is disconfirmed by some kind of evidence. For example, if a particular linguistic theory presents hypotheses about language learning and language structure which are disconfirmed by neurological evidence, this linguistic theory will reasonably be considered unrealistic. That would be the case for a theory proposing that an individual's linguistic and semological systems consist of arrangements of symbols. This hypothesis is disconfirmed by the following facts (Lamb, 2005):

- It requires a device in the brain that can read information in symbolic form, but our brains do not have such a device.
- It requires some symbol storage, but the brain does not store symbols (in the way that a computer does).
- The process of interpreting symbols requires additional devices, not only storage for the symbols, but also a buffer in which to store the input item while the process of recognition is going on, and a device to perform comparisons; however, our brains do not have such additional devices.

Systemic Functional Linguistics has never assumed, nor denied, that the linguistic system in the brain must store symbols. It has been stated that symbols are still part of the linguistic structure described in systemic networks. But this fact just mentions a technical device that is used to account for the choices available for the speakers. It does not imply any assumption about the actual organisation of the neurocognitive system of the individual.

Against the hypothesis that our brain stores symbols, a more realistic alternative is to assume that the internal structure does not have symbolic representations of phonemes, morphemes or lexemes, but does have the means for producing such forms in oral or written texts. The relational network theory applied in this chapter is attractive from a neurological point of view because it is compatible with neurological evidence. Neuroscience research has shown that the cerebral cortex *is* a network, and that learning develops as a strengthening of connections. The basic processes involved in text comprehension operate directly in the network "as patterns of activation travelling the pathways formed by its lines and nodes" (Lamb, 2005:157). Linguistic and semological information is not stored as symbolic representations, but *it is in* the connections.

There is a good amount of neurological evidence for relational networks. However, there is no direct experimental evidence for some of their features, for the following reasons:

- Brain images are too rough for the study of microscopic levels (Cherchi, 2000; Lamb, 2004a).
- Experiments with the living brain tissue of animals are not done with humans, for obvious ethical reasons.
- Experiments with the living brain tissue of animals deal with the visual, auditory and somatosensory perception of cats and monkeys (Hubel & Wiesel, 1962, 1968, 1977; Mountcastle, 1997, 1998), and these animals do not perform linguistic processing.

On the other hand, there is a good amount of relevant indirect evidence for the neurological plausibility of relational network theory. For example, Hubel and Wiesel (1962, 1968, 1977) discovered that visual perception in cats and monkeys works in the ways that would be predicted by the relational network model, and the nodes of the visual network are implemented as cortical columns: "The nodes are organized in a hierarchical network in which each successive layer

integrates features from the next lower layer and sends activation to higher layers" (Lamb, 2005:168).

The eminent neurologist Vernon Mountcastle discovered and characterised the columnar organisation of the cerebral cortex. In his book *Perceptual Neuroscience: The Cerebral Cortex* (1998), he explains that the basic unit of the mature neocortex is the cortical *minicolumn*, a narrow chain of neurons that extends vertically across cellular layers II to VI. Each minicolumn contains about 80 to 100 neurons and all the major phenotypes of cortical neural cells. Mountcastle's general hypothesis is that the minicolumn is the smallest processing unit of the neocortex, and he also claims that "every cellular study of the auditory cortex in cat and monkey has provided direct evidence for its columnar organization" (1998:181). For example, a nerve regeneration experiment in the monkey provides evidence for columnar organisation of the somatic sensory cortex. A recording microelectrode was passed nearly parallel to the pial surface of the cortex of the postcentral somatic sensory cortex, through a region of neurons with the same modality properties. Neurons in adjacent minicolumns are related to adjoining and overlapping peripheral receptive fields, and the transitions between minicolumns pass unnoticed. Results obtained in the same animal in a similar experiment after section and resuture of the contralateral medial nerve showed a misdirection of the regenerating bundle of nerve fibres, innervating then the glabrous skin of the hand. Sudden displacements of receptive fields, which occur at intervals of 50–60 μm, reveal the minicolumns and their transverse size (Kaas *et al*., 1981, cited by Mountcastle, 1997:708, 1998:173).

Since speech perception is a higher-level perception process, it is permissible to suggest the following extrapolation: each node in the neurocognitive system of an individual can be implemented as a cortical column. Within the linguistic system, every node / cortical column has a highly specific function. For example, there may be a node / cortical column corresponding to a single lexeme like *cat*.

Now, we see that the relational network model requires (*before* considering its neurological plausibility) the following types of connectivity among its nodes, and the following types of properties for its connections (Lamb, 2005:170):

1. Connections can have varying strengths.
2. Connections are strengthened through successful use (the learning process).
3. Connections of given strength carry varying degrees of activation.
4. Nodes haves varying thresholds of activation.
5. The threshold of a node can vary over time (part of the learning process).
6. Connections are of two types: excitatory and inhibitory.
7. Excitatory connections are bidirectional, feed-forward and feed-backward.
8. Excitatory connections can be either local or distant.

9. Inhibitory connections are local only.
10. Inhibitory connections can connect either to a node or to a line; the blocking element attaches to a line.
11. In early stages (pre-learning) most connections are very weak (latent).
12. A node (at least some nodes) must contain an internal wait (delay) element, needed for sequencing, for example of the part of a syllable or of the constituents of a construction.

Examination of the evidence shows that minicolumns and their interconnections have every one of these properties. For example, the internal delay element (Number 12 in the above list) is implemented by means of axon fibres which branch off from the axons of pyramidal cells within a column and connect vertically to other cells in the same column: "[F]rom layer VI they project upwards and from upper layers downward. This circulating activation among the pyramidal cells of a column keeps activation alive until it is turned off by inhibitory neurons with axons extending vertically within the same column. Such inhibitory cells are called double basket cells" (Lamb, 2005:170).

There are also relevant considerations about the number of minicolumns that an individual would need in order to represent linguistic information. For example, when estimating the huge number of minicolumns in Wernicke's area, Lamb (2005:172) suggests that there could be approximately 2,800,000 minicolumns in that area. This number could allow an individual to represent all the information needed for phonological perception.

On the basis of previous remarks, we can provide an argument for the neurological plausibility of relational networks:

1. Nodes represented in relational networks are implemented (with an important level of abstraction and generality) as minicolumns.
2. Connections represented in relational networks are implemented (with an important level of abstraction and generality) as fibres.
3. Minicolumns and fibres integrate real cortical connections.
4. Therefore, relational networks represent (with an important level of abstraction and generality) real cortical connections.

It was suggested in Section 9.2 that systemic networks can be converted into neurocognitive relational networks, which are neurologically plausible. However, this does not mean that we can conclude that systemic functional characterisations of language structure and language function are neurologically plausible per se. It has already been stated that Figures 9.7 and 9.13 lack operational plausibility, which is a prerequisite that must be satisfied *before* the aim of reaching neurological plausibility.

Nevertheless, Systemic Functional Linguistics describes convincingly many linguistic phenomena, for example clause structure and the simultaneous presence of several meanings within the clause. On this basis alone we can have the right to conclude that Systemic Functional Linguistics is a realistic theory,

as an 'analytical' theory. This conclusion is not unimportant, nor irrelevant. It allows us to suggest that a realistic analytical theory, like Systemic Functional Linguistics, can be used in contexts where there is no need to account for operational (and neurological) plausibility, simply because we are talking about the products of linguistic behaviour. For the purposes of teaching English grammar or understanding text coherence, the additional precision required for operational and neurological plausibility is not needed.

9.4 Conclusions

The systemic functional concept of 'choice' can be interpreted within the neurocognitive framework. This interpretation demonstrates that the two approaches are compatible. On the basis of this compatibility, linguistics can be able to account for language both as a biological system and as a social semiotics.

1. Halliday's systemic networks, which include symbols as part of their structure, can be converted into relational networks, i.e. into pure relationships. This allows us to begin to see how the two notational systems are related.
2. However, systemic functional networks are very different from neurocognitive relational networks. The former describe potential paradigmatic choices, i.e. the potential of the linguistic system, a full range of options available for language users. (It could be accepted that they also predict potential speaker behaviours.) The latter aim at being operationally and neurologically plausible accounts of some part of the linguistic system of an individual.
3. Systemic Functional Linguistics is a realistic 'analytical' theory. It accounts for concrete instances at the lexicogrammatical level, analysing, for example, the structures of clauses and the simultaneous presence of several meanings/metafunctions. It also accounts for potential choice, providing system networks in which systems of options available for language users are represented.
4. I had embarked on this study with a view to confirming how system networks were operationally and neurologically plausible. However, the findings are something different: while a system network can be translated into relational network notation, the results have not taken the form of genuinely relational networks, i.e. operationally plausible accounts. It seems that what has been found can be represented in Table 9.5. The question mark in Table 9.5 makes reference to something that has yet to be explored. It would be a description of an operationally plausible account in a more readable form.
5. Some years ago, H. A. Gleason, Jr. wrote that Stratificational Grammar gave an intuitively more satisfying picture of language organisation than any other proposal. He did not claim "final answers or ultimate indisputable truth", but he did claim "a step forward in our understanding, or, at least, the

Table 9.5. *A brief comparison of the information presented in systemic and relational networks*

Type of information	In systemic network notation	In relational network notation
Taxonomy of choices	System networks	'Translations' in this chapter, for example Figures 9.7 and 9.13.
Operationally and neurologically plausible account of (any part of) the linguistic system	?	Relational networks

first tentative feeling for the solid ground on which that step will be planted" (Gleason, 1964:95). In future pieces of research, it will be necessary to provide genuine relational networks for phenomena like those treated in Figures 9.7 and 9.13. This chapter has hopefully been another step on solid ground. The next steps in this exploration will allow us (among other things) to account for the relation between semantic choice and what goes on in the brain.

Part III

Linguistic Constraints on Choice

10 *There*-constructions as a choice for coherence in the recent history of English

Ana Elina Martínez-Insua

10.1 Introduction

This chapter approaches the notion of choice by paying attention to the so-called *there*-constructions (hereafter, TCs) and the thematic organisation of texts in the recent history of English.[1] The investigation is part of a larger project on the degree of textual variation in the recent history of the English language as far as the syntax and structure of clausal constituents is concerned, and comes to complete Martínez-Insua's (2011) analysis of the informative configuration of the TCs, where it was initially approached from a centring perspective. Keeping to the systemic functional framework, the chapter explores the possible relation between the structures under analysis (TCs) and the distinction first made by Brennan, Friedman and Pollard (1987) between 'smooth-shift' and 'rough-shift' transitions from one sentence to another (see Hurewitz, 1998:278–280, for the notion and typology of shift). This, ultimately, will help to investigate the interaction between the speaker's choices of word order and information structure in English, where word order is not free.

The chapter approaches choice as selection, as "the act of choosing among the options of a system" (Matthiessen *et al*., 2010:69). The possible lack of intentionality and/or consciousness in the process of selection is assumed and accepted, even though a degree of deliberation in the choice of TCs will be suggested. In Berry's words (this volume), although "the majority of linguistic choices made by humans are at or near the fully subconscious end of the scale . . . [h]umans do choose; they make choices (whether conscious or subconscious) when they produce texts" (bold as in original). Similarly, as explained by Halliday (this volume), "[c]hoosing to act, whether materially or semiotically, is typically a subconscious process. But it can always be brought into conscious attention, and reflected on." Approaching linguistic constraints

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on Choice, this chapter considers the textual conditions that may determine the appropriacy of TCs, accepting that their selection may be favoured, enabled and/or constrained by their position in the ongoing text (see O'Donnell, this volume). Similarly to what Thompson (this volume) does in this same section, I will consider text type as a variable that may affect Choice. As in Urbach's (this volume) study, the diachronic analysis will be connected with the discussion of Choice in context, and the possible need to speak of diachronic change will be contemplated.

TCs illustrate that human languages may offer different lexicogrammatical devices (different instantiations) to present processes and participants, depending on which referent the speaker intends to present as Theme of the message. Many TCs illustrate what Włodarczyk and Włodarczyk (2006:12) term 'diathesis': "[t]he grammatical device used to present the same situation from different points of view (i.e. choosing this or that participant of the situation as global C[entre of] A[ttention])."[2] As cases of diathesis, TCs are "not mainly a problem of syntax and semantics, but . . . most of all a device belonging to the pragmatic [textual, in systemic functional terms] level" (2006:12). Thus, in cases such as (1a) and (1b) below, where either a TC (with an Existent) or a canonical Subject + Verb (+ Object) construction are possible, the choice of one or the other is conditioned by the speaker's communicative purposes and the coherence of the text where the utterance occurs:

(1) a. There is a snake in the backyard.
b. A snake is in the backyard.

The chapter rests on the assumption that the text (as product or instance; Halliday & Hasan, 1985) is a configuration of simultaneous discrete choices from the paradigm, or choices *in praesentia* (Urbach, this volume). In tune with O'Donnell's (this volume) 'evolutionary' approach to text linguistics, the text is regarded as the series of choices we make during its production (which may be the result of certain constraints), and text composition is a process in the course of which the text evolves to its final form. Additionally, the chapter rests on the acceptance that there is no one-to-one correspondence between the propositional meaning(s) and the textual dimension of the text.

TCs instantiating diathesis allow speakers to introduce the so-called notional subject of the utterance as Existent, while the subject slot is filled by a dummy (informatively empty) element (*there*). This provides the construction with a textual and pragmatic dimension that should not be neglected (see Martínez-Insua, 2004; Martínez-Insua & Pérez-Guerra, 2006; Breivik & Martínez-Insua,

[2] Centres of Attention are "semantic entities that are part of the discourse model for each utterance in a discourse segment" (Walker *et al*., 1998:3).

2008). In fact, the textual dimension of TCs seems to be among the most important motivations for their use in cases such as (1), where a SVX counterpart might have been used instead, maintaining communicative felicity. By paying attention to the codification of information in the clause in relation to the ongoing discourse context, we will try to approach the functional attempt to handle alternative presentations of information in the clause by referring to "a set of pragmatic functions assigned right at the end of the process for building underlying clause structure" (Butler, 2003:81).

Halliday's Functional Grammar (FG), the so-called 'Sydney Grammar', and its strong stand on the functional motivation of language, will serve as theoretical background for the interpretation of TCs, assuming that "[l]anguage has evolved to satisfy human needs; and the way it is organized is functional with respect to these needs – it is not arbitrary" (Halliday, 1994a:xviii). The aim is to present the usage of TCs as the result of a number of interrelated options that help to make meaning, assuming that "[s]uch options are not defined by reference to structure; they are purely abstract features, and structure comes in as the means whereby they are put into effect, or 'realized'" (1994a:15–16).

The chapter will pay special attention to the textual metafunction and the two distinct sets of choices that may be located in this metafunction (Butler, 2003:173): choices concerned with the process of thematisation, and choices concerned with the distribution of given and new information in the text. The Theme of the clause will be taken here as defined by Halliday and Matthiessen (2004:64, 66): "the first group or phrase that has some function in the experiential structure of the clause which serves as the point of departure of the message; locating and orienting the clause within its context". Notice, however, that Thompson's (2004) proposal to refine such definition in the case of TCs will be accepted in the following paragraphs. As explained by Berry (2013), if the Theme is the orienting section of the clause, where not only topical information can be given but also the tone of the message can be set and the clause can be located within its context, it seems reasonable to expect that choices made in this area of a clause might well contribute to the success or lack of success of a text. Having no precise reference, the Theme in TCs is to be regarded as a content-light Theme, in Berry's terms. Section 10.2 will revisit the notion of Theme in TCs.

In what follows, the functional description of TCs will be discussed in Section 10.2, while Section 10.3 will concentrate on the analysis of TCs in the recent history of English – from late Middle English (lME) to Present-Day English (PDE). Details of the textual material employed for the study and the analysis of the findings will also be presented in this section, where the distribution of TCs will be studied in connection with the variables of medium of expression and text type. Comments on the textual and communicative aspects of TCs, as well as a brief approach to a number of syntactic aspects

prototypically present in TCs, will be provided in the corresponding subsections. Finally, some concluding remarks will be offered in Section 10.4.

10.2 *There*-constructions in Functional Grammar

A few words on the characterisation of TCs from the perspective of Functional Grammar seem necessary at this point.

The experiential level of analysis focuses primarily on the propositional content of the clause rather than the speakers' purposes when they utter clauses. At this level of analysis, existential processes (having *there* as Subject) express the mere existence of an entity, without predicating anything else of it (Halliday & Matthiessen, 2004:175; Thompson, 2004:104). The Existent is the only participant in these clauses and there is a clear contrast between the informatively empty *there* (needed as Subject given the features of English language) and the informatively full Existent that appears in postverbal position. According to Thompson (2004:105), by using an existential process, the speaker chooses not to represent the Existent as involved in any 'going-on'. This is, however, not necessarily true for the few cases of TCs with non-intensive verbs (e.g. *In through the window there flew a bird*),[3] which behave differently from *be* TCs. Regarding the interpretation of the TC as a whole – and more specifically *there* – in the communicative event, addressees identify the experiential content of *there* in a very general way, merely as a participant of the situation which must belong to a class of entities (either +human or –human) but without selecting any particular element of these classes. The experiential content of *there* is not explicitly expressed in the utterance. It is, in turn, recognised a posteriori, only when the addressees interpret the utterance as a whole.

At the interpersonal level of analysis the clause becomes the exchange going on between speaker and listener. Attention is concentrated on the study of the Mood, which contains much of the interactive work of the clause, as opposed to the Residue, that contains everything else other than Subject and Finite. Mood in TCs is formed by the Subject *there* and the Finite. Thus, what in other approaches to language is regarded as the notional subject of the TC, the postverbal constituent, forms part of the Residue in FG. Notice that the study of the subjecthood of *there*, as well as its possible role in anticipating the actual 'logical subject' of the clause, merits close attention, but must be left for further research.

Finally, Halliday and Matthiessen (2004:257) maintain that, textually speaking, the Theme of existential sentences is "just the feature of existence (*there*)", which allows the addressee to prepare for something that is about to be introduced and presented as new information. Thompson (2004:161ff.), in turn,

[3] I would like to express my gratitude to the anonymous reviewer who proposed this example.

considers that such an assumption leaves the Theme of the clause without any experiential content, due to the lack of representational function of *there*. In his own words,

> existential clauses typically take as their starting point the simple fact that some entity exists . . . The existence is signaled not just by 'there' but also by 'there' plus the existential process (typically realized by the verb 'be'). Thus it seems to make sense to include the process in Theme – and, in addition, this means that the Theme includes experiential content. (2004:161)

Thompson's view is accepted here, in keeping with the conception of Theme as the orienting region of the clause where the tone of the message may be set (Berry, this volume), and also with the idiomatisation of *there*+verb as a bleached starter or marker for existential or presentational utterances (*there's*). In this line, it has been accepted that, informatively speaking, given that *there*+verb constitutes a bleached starter, an 'invariant particle' (Harris & Vincent, 1980:806) or simply a 'marker' for an existential or presentational utterance, TCs undergo a significant degree of idiomatisation. This, in turn, accounts for the tendency towards *there's* in the place of *there is* and even *there are*, particularly in spoken language (Meechan & Foley, 1994). The idiomatised character of *there+be* also explains the difficulty of inserting verbs other than intensives in the TC.[4]

10.3 *There*-constructions in the recent history of English

10.3.1 Corpus and distribution of there-*constructions*

The data for this analysis have been taken from three electronic corpora of English. For the late Middle English (lME) and early Modern English (eModE) periods the investigation is based on the findings reported in Pérez-Guerra (1999: Chapter 3), with empirical evidence from the subperiods lME (1420–1500), eModEI (1500–1570), eModEII (1570–1640) and eModEIII (1640–1710) of *The Helsinki Corpus of English Texts* (HC; Kytö, 1996). The late Modern English (lModE, 1700–1990) data have been taken from *A Representative Corpus of Historical English Registers* (ARCHER; Biber *et al*., 1994). Finally, the *Lancaster–Oslo/Bergen Corpus of British English* (LOB; Johansson, 1978) and the British National Corpus (BNC; Aston & Burnard, 1997) have been used as a source for the Present-Day English (PDE) period. Table 10.1 displays the periodisation and word totals.

[4] Although acceptable in *In through the window there flew bird*, TCs with non-intensive verbs behave differently from TCs with *be* in many respects (Pérez-Guerra, 1999:72–74).

Table 10.1. *Periods and word totals*

Period	Corpus	Words in corpus	No. of words analysed
lME	HC	213,850	71,097
eModEI	HC	190,160	61,219
eModEII	HC	189,800	75,762
eModEIII	HC	171,040	62,940
lModE	ARCHER	approx. 1.7 million	319,694
PDE	LOB	approx. 1 million	98,007
	BNC: spoken	approx. 10 million	501,656
	BNC: written	approx. 90 million	505,534
Total			1,695,909

Table 10.2. *Distribution of TCs*

Period	Raw figures	Normalised figures (/1,000 words)
lME	93	1.3
eModEI	151	2.46
eModEII	126	1.66
eModEIII	119	1.89
lModE	626	1.95
PDE	2,892	2.61
Total	4,007	2.36

Every declarative TC occurring in the textual material was considered for the analysis, and their overall distribution is set out in Table 10.2.

In the light of the frequencies in Table 10.2, and considering that the progressive increase of TCs in the periods under investigation is the most significant finding (from 1.3 instances in lME to 2.61 per 1,000 words in PDE), the *there*-strategy may be assumed to have been a reasonably productive construction in all the periods under analysis (e.g. approximately 2 instances per 1,000 words, especially from eModEI to PDE). For the period 1980s–1993, 245,795 occurrences of existential *there* were attested in 98,313,429 words of the BNC, which indicates a normalised frequency of 2.5 occurrences per 1,000 words.

The frequencies attested – especially the PDE figures taken from the BNC – allow a finer analysis of the data with respect to the distribution of TCs per medium (Table 10.3). In general, higher frequencies of TCs are attested in speech-based texts across periods. This is in agreement with Martínez-Insua (2004:78–79; and contra Pérez-Guerra, 1999:95, who rejects any sort of connection between medium and distribution of TCs in lME and eModE passages),

Table 10.3. *Distribution of TCs per text type*

Text type	Statistics	lME	eModEI	eModEII	eModEIII	lModE	PDE
scholarly	raw	41	48	37	28	113	325
	/1,000 words	1.35	2.11	1.55	1.35	1.56	2.25
law and social	raw	2	3	0	0	18	177
	/1,000 words	0.36	1.42	0	0	1.59	2.86
fiction	raw	19	4	20	13	187	190
	/1,000 words	2.84	1.21	1.4	1.57	2.04	2.25
letters	raw	3	17	4	19	62	–
	/1,000 words	0.79	1.86	0.53	1.85	2.23	–
sermons and speeches	raw	19	19	23	12	104	408
	/1,000 words	1.09	3.26	4.5	2.71	2.77	3.24
other formal writings	raw	9	48	36	47	239	177
	/1,000 words	1.4	3.36	1.38	2.81	1.65	1.57

where a higher frequency of TCs in speech and speech-based texts was attested in PDE. It is also in line with Berry's (2013) hypothesis that a majority of Subject Themes will be content-light in informal spoken texts. In fact, her analysis of Subject Themes in children's writing attests higher frequencies of the content-light Subject Theme *there* in texts produced by children who write 'as they would speak'. Additionally, the findings displayed in Table 10.3 are in line with, among others, those of Breivik (1989:53, 1999:10) and Biber *et al.* (1999:957), who associate the higher frequency of TCs in the spoken medium to the looser syntactic organisation of speech. The presentational/presentative function is taken as more natural in speech-based or spoken texts, where deictic conditions and needs are evident. The higher statistical productivity of TCs in speech could be explained by the fact that speech demands the definition of local or immediate scenarios in which the events take place, which, in the case of written production (by definition, long-lasting), can be shared by several sentences. Once a setting or scenario has been established in written discourse, it remains available for the subsequent discourse. By contrast, the online nature of speech requires the regular definition of scenarios (Martínez-Insua, 2004:79).

Two main conclusions can be drawn in the light of Table 10.3. First, there is an increase in the use of this strategy in practically all the text types in PDE, which is in keeping with the previous remark on the statistical consolidation of the construction. Second, despite some minor cases of statistical disparity, Table 10.3 suggests that TCs occur slightly more frequently in letters and sermons/speeches in lModE and PDE. Initially, this seems to corroborate the

general preference for the strategy in both the spoken and the written-to-be-spoken media. However, the percentages are so similar in the contemporary period that one can conclude that the distribution of TCs in PDE is not subject to textual categorisation. The statistical homogeneity evinced by the figures in the PDE column indicates that the TC cannot be assessed as a marker of specific text types, but rather as a textual strategy evenly selected in the various textual variants.

10.3.2 Informative aspects of there*-constructions*

Under standard assumptions (Quirk *et al*., 1985:89, among others), TCs have been claimed to be syntactic strategies which allow the accommodation of notional subjects conveying unshared information in sentence-final position, thus agreeing with informative principles such as 'given before new', 'end-focus', etc. In this vein, since *there* has been described as an informatively vacuous marker, and the majority of the verbs which are usually found in TCs are not informatively significant either, the whole utterance may be taken as new, informatively speaking. This informative newness, as a characteristic of the whole utterance yet concentrated on its Existent, implies the presentative effect of the utterance, which is subsequently characterised as 'presentative' or 'presentational'. In Berry (2013), the presentative *there* Subject Theme allows all the important information to occur later, where it can be clearly heard.

Generally treated as existential or presentative utterances (both labels are used indistinctively here; see Hannay, 1985, or Huddleston & Pullum, 2002, for the distinction between 'existential' and 'presentative/presentational'), TCs have the function of conveying either the actual or the metaphorical appearance of a certain referent on stage. From this perspective, the main goal of TCs is to bring into the hearer/speaker's awareness the referent materialised by the Existent (see Bolinger, 1977:110–111). This cognitive process of bringing a certain entity to the attention of the hearer/speaker includes Davidse's (1999) function of 'instantiation of a general type'. That is, the TC individualises the Existent and converts it into a specific entity for the audience. The fact that the presence of *there* brings about the existential reading of the Existent has led Pérez-Guerra (1999:81ff.) to hypothesise that *there* is not a prototypical dummy element but rather a grammaticalised meaningful discourse marker with informative consequences on the utterance in which it occurs. The informative loading of *there* receives support from those scholars who maintain that *there* has a locative flavour. In Breivik's (2000:28) words: "[a]lthough *there*$_1$ [our *there*] has undergone desemanticisation and can no longer refer to a concrete location, it still carries some locative meaning . . . *There*$_1$ designates . . . a 'mental space', i.e. a space where conceptual entities are located."

The Existent, in turn, may be claimed to be forward-looking informatively speaking, as it conveys new, focal, unfamiliar, unshared information;

information "which the speaker assumes is not in the hearer's consciousness prior to the utterance" (Van Oosten, 1986:46). In other words, the Existent conveys information new to the discourse and to the hearer (for the dichotomy hearer old/new vs. discourse old/new, see Prince, 1992). In order to examine the informative content of the entities occurring as Existents in the TCs listed in the database, a very basic taxonomy of referentiality including three categories of Existents was adopted:

i. Referring (broadly comparable to Walker *et al.*'s, 1998, backward-looking centres)

(2) [And be itt further enacted by the Authority aforesaid That if such Sheriff Goaler or Keeper of Prison being duely sumoned to appear before the said Justice or Justices of the Peace shall . . . refuse . . .] *such Sheriff Goaler or Keeper* . . . shall. (Statutes VII:75)

ii. Low referring

(3) [master Robert haughtily bad him be silent and know himself, and not presume to contend with men so much his superiors in every respect . . . Master Robert was to be presented at court before his departure,] and it was expected that *he* should be knighted. (REEVE-1777,26.574)

iii. Non-referring (broadly comparable to Walker *et al.*'s, 1998, forward-looking centres)

'Referring' segments (the unmarked subject in italics in (2)) are, informatively speaking, not new in the discourse domain, which, following the relevant literature (Hajicová & Vrbová, 1982; Ariel, 1996; among others), comprises seven utterances previous to the expression and up to five utterances in the subsequent context. The 'referring' segment may represent a link back to an entity evoked earlier than in the immediately prior sentence, in agreement with Birner's (1998:320) claim that "the centering algorithm may need to be made more flexible" in order to accommodate cases where centring applies to non-adjacent utterances, especially if the "intervening utterances constitute an embedded discourse segment". 'Low-referring' expressions (the italicised personal pronoun in (3)) are instances of semi-availability, that is, when only a pronominal reference or the non-head portion of the constituent (a modifier, a complement or a conjunct) is textually available. Finally, 'non-referring' segments are neither referring nor low-referring; they are informatively new and therefore unavailable in the discourse.

As evinced in Figure 10.1, data taken from the recent history of English allow the characterisation of the TC as a strategy that mainly brings to the addressee's attention informatively new material, be it (absolutely) non-referring or (partially) low-referring. Along with this, the characterisation of the Existent as a carrier of new focal information is favoured by the fact that

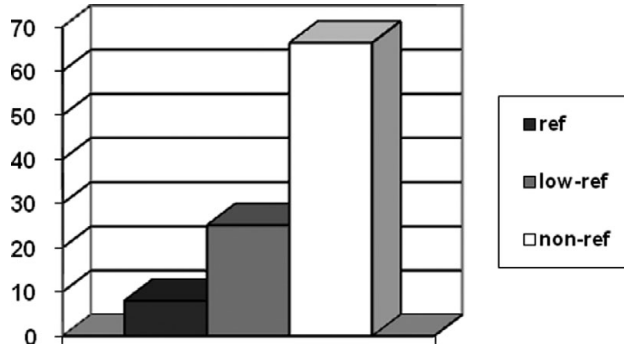


Figure 10.1. Informative potential of the Existents in the TCs

(backward-looking) constituents containing referring information have been noted to prefer initial position within TCs, namely initial adjuncts or fronted complements (see Pérez-Guerra, 1999:111). According to those findings, 51.5 per cent of such constituents convey referring information. The TC thus satisfies to a large extent the traditional principles of given-before-new and end-focus, which have a prominent role in the characterisation of the strategy.

Certain connections may be established between the above-mentioned features and some of the characteristic aspects of other thematic systems, such as right dislocation (Grosz & Ziv, 1998) and inverted constructions (Birner, 1998). On the one hand, as with right dislocation, the joint usage of a proform (*there*) and a postverbal description serves to establish discourse coherence, especially in contexts where the introduction of new information in initial position should be avoided (see Brown & Yule, 1983:155, for the description of the unmarked sequencing of information structure as *given−new*). As in the case of right dislocation (Grosz & Ziv, 1998:294), the linguistic structure and the textual features of our presentative utterances ultimately depend on their 'intentional structure'. The satisfaction of the discourse purpose of the TC (i.e. the introduction of a referent as unfamiliar) contributes to the satisfaction of the overall communicative purpose of the discourse. On the other hand, TCs are close to inverted constructions in that the information presented in the postponed segments (the Existent) is consistently less familiar within the discourse than that presented in the preposed segments (the quasi-empty Subject *there*, in this case). As with cases of inversion, communicatively and informatively speaking, TCs may help to organise the discourse "when standard reference and discourse processing are not sufficient" (Grosz & Ziv, 1998:305). They either help to retrieve and refocus formerly centred Existents (low-referring), or constitute genuine shifts from the text to some situational entity. As in certain cases of right dislocation, TCs are the result of the speaker's desire to shift

attention to entities or situations that are "not currently sufficiently salient" (1998:305), even if they may be present in the discourse context (either explicitly or as inferable information). TCs may be described, then, as a tool for the speaker's choice to postpone unfamiliar information and place it in the postverbal position of the utterance for the sake of maintaining discourse coherence. The usage of TCs may be characterised as the speaker's choosing to avoid the introduction of new information in thematic position, helping to soften what some scholars call 'rough-shift transitions' (Walker *et al*., 1998:4). Thematic strategies such as TCs may favour smooth shifts from one referent into another and they may become the preferred – or more coherent kind of – transition between utterances, requiring less processing time than other transitions.

Finally, it seems worthwhile mentioning that according to the findings the informative description of the major participants in a TC has not undergone significant diachronic changes, since the itemised results, the frequencies, per period are quite homogeneous throughout the samples analysed (see Pérez-Guerra, 1999:111–112, for further discussion).

10.3.2.1 The 'definiteness restriction'

Given the tendency for Existents to convey new information, and knowing that "[i]t has often been observed that, in English, new information is characteristically introduced by indefinite expressions and subsequently referred to by definite expressions" (Brown & Yule, 1983:169), the indefinite character of nominal Existents has been treated as a constraint resulting from the communicative nature of TCs. This has usually been described in terms of the so-called 'definiteness restriction', which blocks the occurrence of definite nominal segments (including proper nouns, personal and demonstrative pronouns, and noun phrases headed by definite or possessive determiners, as well as the quantifiers *all*, *every* or *each*) as Existents of the TC.

(In)Definiteness in TCs has been approached from a wide variety of perspectives: from explanations based on the dichotomy definite versus indefinite (Baker, 1973; Jenkins, 1975; Freeze, 1992) to more flexible standpoints built around the concepts of context and (non-)contextualised existentials (Holmback, 1984; Hannay, 1985; Abbott, 1993, 1997; Birner & Ward, 1998). In the context of formal linguistics (Safir, 1985), definiteness has been described as a formal property of determiners. Occasionally, it has been taken as a conceptual category (Bolinger's, 1977, distinction between 'grammatical definiteness' and 'semantic definiteness'), but in a number of cases definiteness has been associated with the assumptions that senders have about the degree of identifiability that the referent presents for the addressee (Prince's, 1992, Ward & Birner's, 1995, and Birner & Ward's, 1998, distinction between 'hearer old/new' and 'discourse old/new').

Even if the combination of newness and indefiniteness seems to be the preferred option among Existents, those formed by definite articles, demonstratives, or even personal pronouns and proper nouns are attested across the periods analysed:

(4) Well, thou art the maddest Fellow, sure there is not your Peer in France. (Trotter, 1701)

(5) And behind him there was little Dutch, crawling with her belly down, and her eyes turned up at us, as if we were dragging her to be hanged. (Blackmore, 1872)

(6) And yet in the subsequent reaches of the great argument, of which these dark regions form the preface, there emerges the clear, calm, steady light of my optimistic text. (Austen, 1979)

Concepts such as the familiarity, uniqueness, inclusiveness and identifiability of the Existent are usually mentioned in the literature when accounting for this presence of definite elements in Existents. However, no conclusive explanation for the compatibility of the definiteness restriction and examples such as (4)–(6) seems to have been found yet. Assuming that (i) the Old/New status of a given constituent corresponds to the way in which its content is introduced into discourse, in that "what is new is in the last resort what the speaker chooses to present as new" (Halliday, 1967b:211), and (ii) "information is validated as O[ld] or N[ew] not by the knowledge about it, but by the very way it is treated in discourse" (Włodarczyk & Włodarczyk, 2008:119), it is here accepted that the Old/New opposition depends ultimately on the speaker's choice, regardless of the status of such information in common knowledge or in previous context. By accepting this, entities already quoted in the text may be treated as new in subsequent parts of the same text, simply because they enter new situations or new relations. Consequently, the presence of definite nominal segments in Existents does not require extra justifications apart from those applicable to TCs in general. The requirement imposed on the nominal Existent is not that of indefiniteness, but rather that it should be communicatively pertinent to (re)introduce its referent at the specific point of the communication in which it occurs. The speaker's choice to present the Existent as new to the hearer, together with its communicative and informative saliency, provide the explanation for the so-called definiteness restriction that formal approaches found difficulties to provide.

Table 10.4 displays the distribution of definite nominal Existents across periods in the corpus under analysis. The findings evince the presence of definite Existents throughout the different periods and confirm their acceptability. Although their frequency is not high, their proportion is reasonably significant, especially if one considers the figures for eModEI, eModEII and lModE.

Table 10.4. *Definite Existents*

lME	eModEI	eModEII	eModEIII	lModE	PDE
4/93 (4.3%)	13/151 (8.6%)	17/126 (13.4%)	5/119 (4.2%)	65/626 (10.38%)	172/2,892 (5.94%)

Table 10.5. *Verbs in TCs*

Period	Be	Intransitive	Transitive
lME	66/93 (70.9%)	20 (21.5%)	7 (7.5%)
eModEI	102/151 (67.5%)	17 (11.2%)	32 (21.1%)
eModEII	97/126 (76.9%)	10 (7.9%)	19 (15.07%)
eModEIII	92/119 (77.3%)	9 (7.5%)	18 (18.51%)
lModE	549/626 (87.69%)	70 (11.18%)	7 (1.11%)
PDE	2,872/2,892 (99.3%)	9 (0.31%)	11 (0.38%)
Total	3,779/4,007 (94.3%)	135 (3.36%)	94 (2.34%)

In Hannay's (1985:101) words: "definite terms may occur quite naturally in existentials on condition that their pragmatic status is not in conflict with the function of the existential predication."

10.3.3 Syntactic features of there*-constructions*

As mentioned above, most of the verbs occurring in the TCs under analysis are intensive verbs, which help the construction bring new entities into the situation frame, and is in keeping with the so-called presentative effect (see Kuno & Takami, 2004:58, for an in-depth account of the functional definition of the type of verbs allowed in TCs). *Be* is the prototypical verb in TCs, although a reduced number of intransitive (*remain*, *meander*) and transitive verbs were also attested.

As evinced by the figures in Table 10.5, despite their presence in TCs, transitive and non-intensive intransitive verbs experience a drastic decrease over time: from 21.1 per cent in eModEI to 0.38 per cent in PDE. The decrease of such verbs over time, together with the increase in the frequency of the TC and the preference for the verb *be* in the recent history of English, may be said to highlight the presentative prototypicality of the construction. Most transitive verbs in TCs appear in the passive form (in line with Pérez-Guerra's, 1999:107, findings), which may be connected, on the one hand, to the fact that they comprise *be* forms functioning as their governing categories or, on

Table 10.6. *Lack of agreement in TCs*

eME	eModEI	eModEII	eModEIII	lModE	PDE
5 (5.3%)	6 (3.9%)	9 (7.1%)	8 (6.7%)	20 (3.20%)	35/1273 (2.74%)

the other hand, to the fact that the use of passive voice implies the informative bleaching of transitive verbs. Unlike active sentences, which tend to focus on actions in progress, passives normally focus on final states presented through the perspective of patient participants. Such a decrease in the semantic weight of transitive verbs is in keeping with the informative emptiness that characterises the verbs in TCs. In these passive sentences, the medium is focused, not the action itself, which is in line with the presentative nature of the construction.

As regards the form of the verb in the TC and its agreement with Existents, in a number of the TCs analysed the Existent and the verb did not agree in number. Most frequently, a singular verbal form and a plural Existent combine, as in example (7) below:

(7) There's some queer things in this one. (Johnston, 1958)

Even though the frequency of TCs lacking number agreement decreased over time – in Table 10.6, from 5.3% in eME and 7.1% in eModEII to 3.20% in lModE and 2.74% in PDE – examples such as (7) were attested in all the periods analysed. This could be taken as a special type of grammaticalisation which is, to a certain extent, counter-intuitive. Even if *there* progressively becomes a functional marker and loses its semantic characteristics, it is difficult to justify that the remaining lexical element (the postverbal NP) lacks number agreement with the verb.

As for the distribution of cases of non-concord taking into consideration the type of verb in the TCs, the findings are not surprising. The great majority of the TCs displaying lack of number agreement contain a form of the verb *be* (in the PDE sample, all the cases of non-concord are *be*-TCs. In the lModE sample, 75% of the TCs lacking number agreement are *be*-TCs).

All these findings seem to support the idea that '*there* + singular verb' is undergoing a process of grammaticalisation and subjectification as a formula useful for introducing (new) forward-looking referents into the discourse, at the same time as it serves a number of communicative, speaker-based functions. Such a proposal is not contradicted by the occurrence of plural verbal forms in a small number of examples with singular Existents (as regards the later periods, two examples have been found in lModE and only one in the written component of the BNC in PDE). Indeed, most of these examples of plural verbal forms and singular Existents find proper justifications in the type of utterance in which

they occur. Thus, structurally speaking, the TC is an embedded clause in (8) and (9) below,[5] and a conditional one in (10) and (11), with the subsequent need for subjunctive forms, at least in (10) and (11):

(8) Than sawe I wele, with the faythe that y felyd, that thare ware nathynge betwyx the crosse & heuen that might hafe desesyd me. (Julian, *c*1450)

(9) we were inform'd there are abundance in the Highlands. (Taylor, 1705)

(10) If there were no deceit, then we should not bee deceiued. (Smith, B4V)

(11) consider if there are a way in which you could instigate a residency which would match your particular skills and expectations to the benefits, tangible or otherwise. (Arts)

Although all the PDE examples without agreement contained *be*-forms, instances with verbs other than *be* were attested in the other periods investigated (e.g. *leave*, *go*, *find*, *live* or *come* in lModE). This shows that the possibility of lack of concord and the processes of grammaticalisation and subjectification are inherent to the whole scope of TCs and not only to the prototype with *be* (the data were given in Table 10.6).

In the lModE and the PDE samples the majority of the Existents in TCs showing lack of number agreement are co-ordinative (70% in lModE, and 59.37% in PDE), as illustrated by (12)–(14). Similarly, in the PDE sample, the presence of (heavy) postmodifying expressions within the Existent and the lack of number agreement seem to be connected (28.13% of the examples without number agreement contain postmodification):

(12) There is a medieval compartment beautifully fitted up, and a suite of Austrian rooms, furnished, floored, etc., exactly as in Austria. (Carroll)

(13) There is still no cure, no vaccine, no wonder drug, for HIV infection or AIDS. (Aids, 1991)

(14) There is at last discussion and pooling of ideas on how to make residential services accessible. (Family, 1990)

Finally, addressing now the typology and syntactic weight of the Existents will now be addressed. The major categories of Existents in the database fall into the following classification: (i) noun phrases or nominal proforms (example (1) above); (ii) co-ordinative structures (in (12) to (15)); and (iii) clause-like or contact constructions, including nexusless postmodifying relative clauses (in (16)):

(15) A grand day for exercising pinnace in and out past box boats – loosing and fuelling, and gun drill and lastly disconnecting and mooring under sail about 3 –1/2 miles, anchoring at 7 off Granaa – where there is a small harbour and many small craft loading with grain. (Hall, 1853)

[5] *Abundance* in (9) might be considered as semantically plural.

Table 10.7. *Typology of Existents*

Period	Noun phrase	Co-ordination	Clause-like	Total
lME	84 (90.32%)	9 (9.67%)	0 (0%)	93
eModEI	136 (90.06%)	14 (9.27%)	1 (0.66%)	151
eModEII	104 (82.53%)	18 (14.28%)	4 (3.17%)	126
eModEIII	96 (80.67%)	23 (19.32%)	0 (0%)	119
lModE	271 (81.13%)	60 (17.96%)	3 (0.89%)	334
PDE	681 (90.31%)	73 (9.68%)	0 (0%)	754

Table 10.8. *Length of postverbal noun phrases*

Category	lME	eModEI	eModEII	eModEIII	lModE	PDE	Average
simple	1.7	2.5	1.9	2.3	2.7	2.4	2.2
expanded	7.6	11.02	10.1	11.5	9.8	9.9	9.9
co-ordinative	9.8	8.8	9.3	9.1	12.8	10.1	9.9
average							7.3

(16) But I assure you there isn't – nothing could be further from my thoughts. (Jones, 1908)

As Table 7 shows, the nominal type is the most productive Existent, percentages being comparable in all periods. Additionally, if the so-called 'clause-like' type is regarded as a strategy of relativisation it could be included in the noun-phrase category. TCs, then, are constructions specialised for placing nominal Existents in sentence-final position (unmarkedly reserved for constituents that convey unshared information). The fact that, in most of the periods, co-ordinated noun phrases (longer than simple noun phrases) do not represent more than circa 15 per cent of the TCs seems to allow for the conclusion that end-weight is not a significant variable in the description of the TC.

Finally, so as to conclude this study of the syntactic features of the TCs in the database, attention will be paid to the syntactic weight of the nominal Existents, understood in terms of number of words and displayed in Table 10.8. Nominal existents have been divided into three categories: simple (nouns preceded by determiners), expanded (with modifiers or complements) and co-ordinative.

As Table 10.8 shows, the average length of the Existents is 7.3 words, considerably longer than the average length of unmarked non-pronominal Subjects given by Pérez-Guerra (1999:56): 3.01 words. At first sight, this seems to place the TC in the group of thematic systems presumably affected by the principle of end-weight. However, a more careful interpretation of the numbers in Table 10.8 suggests that, even though end-weight plays a role in the

characterisation of TCs, this principle alone cannot provide a satisfying explanation of the construction. First, the proportion of simple noun phrases, for example, is 12.5 per cent in PDE Existents, which implies that at least this percentage of the examples somehow comply with the length of preverbal subjects mentioned above (3.01). Second, Pérez-Guerra (1999:108) claims that the average number of words of constituents other than the subjects, that is topicalised complements or adjuncts, is 5.6 words from lME to PDE. Since the contrast between the length of the Existent and that of sentence-initial segments other than the subjects is not a sharp one, it can be concluded that, unlike the case of other thematic systems (e.g. subject extraposition), end-weight is not the triggering variable in a TC.

10.4 Conclusions

The main aim of this chapter has been to characterise TCs from a functional perspective, taking as a basis a corpus-based investigation of their use in the recent history of English (from lME to PDE), and investigating to what extent their usage may be regarded as linked to the speaker's choice for coherence. TCs have been presented as structural devices – frequently being the thematic variants of other structures with the canonical SVX word order – for the organisation of meaning in context. TCs have been presented as constructions where the syntactic subject is a content-light Subject Theme which makes a very specific type of meaning choice available: that of providing no referential meaning in the Subject Theme.

Even though the chapter attempts to illustrate the potential of the SFL framework to manage diachronic change in language, further in-depth analysis of diachronic data will be necessary to confirm or refute whether TCs have become the preferred transition between sentences in the course of time. The findings evince the productivity of the construction in all periods and the progressive increase in its frequency. Such an increase underlines the statistical consolidation of the strategy in the recent history of English. While higher proportions of TCs were attested in speech and speech-based texts (especially in PDE), their distribution among text types did not show significant differences. In this sense, *there*, as a content-light Theme, seems to be favoured by medium and co(n)text rather than by register or text type (Berry, this volume). Its homogeneous distribution among the text types in PDE favours the hypothesis that the strategy consolidated itself in later periods. On the same lines, the acceptance of the progressive grammaticalisation of the structure around an invariable *there's* marker (even with plural Existents) gives support to the acceptance of the TC as a specific scheme of the declarative mood.

When looking at the Existent and its postverbal position, the end-weight principle has been claimed not to constitute the triggering factor that determines

the postverbal distribution of the constituent. In fact, the length of many simple nominal Existents is equivalent to that of the vast majority of the unmarked (preverbal) subjects. From an informative perspective, TCs have been said to bring to the addressee's attention informatively new material, either absolutely new (non-referring), or partially new (low-referring). Using Berry's (2013) terminology, the retrieval of the notional subject from the area of the Theme, its substitution with a content-light Subject Theme, and the occurrence of the relevant information in postverbal position, seems to be triggered by thematic weight, rather than end-weight, particularly in contemporary spoken English and informal written English (Berry, personal communication). The diathetic nature of the TC, as one of the possible textual realisations of a given propositional meaning, has been presented in agreement with the notion of Choice as selection.

In essence, the aim of the chapter has been to connect the usage of TCs in the recent history of English and the process of choosing, as presented by Halliday (this volume); that is, appending three riders to it: (i) in a given context, (ii) with a given output, (iii) at a given probability.

Primary sources cited

Aids = (1991) Aids care education & training. London. (bnc a0_116)

Arts = (1993–94) *The artist*. Tenterden: The Artist Publishing Company Ltd. 5–47. (bnc cl0548)

Austen, Jane. 1979. 2nd edn. Jane Austen's letters to her sister Cassandra and others. Ed. R.W. Chapman. Oxford University Press. (archer 1800aust.x5)

Blackmore, Richard Dodderidge. 1872. The maid of Sker. (archer 1872blac.f6)

Carroll, Lewis. = Ed. M. N. Cohen 1979. The letters of Lewis Carroll. *Volume* 1: 1837–1885. New York: Oxford University Press. 17–18. (archer 1851carl.x6)

Family = (1990) Family work with elderly people. Basingstoke: Froggatt, Alison, Macmillan. 1–107. (bnc cgd)

Hall, William. 1853. The diaries of William King Hall, 1829–1877. Ed. L. King-Hall. Sea Saga. (archer 1853hall.j6)

Johnston, Denis. 1958. The scythe and the sunset. The dramatic works of Denis Johnston Vol. 1. (archer 1958john.d9)

Jones, Henry Arthur. 1908. Dolly reforming herself. Ed. C. Hamilton. Representative plays by Henry Arthur Jones. (archer 1908jons.d8)

Julian = Julian of Norwich (*c*1450 (*c*1400)) Julian of Norwich's revelations of divine love. The shorter version. Ed. F. Beer (1978). Heidelberg: Carl Winter Universitaetsverlag. (hc q_m3/4_ir_relt_julnor)

REEVE = Kroch, A., Santorini, B. & Diertani, A. 2010. Penn Parsed Corpus of Modern British English. Available at: <http://www.ling.upenn.edu/histcorpora/PPCMBE-RELEASE-1/info/reeve-1777.html>.

Smith, H. 1591. Two sermons on 'of usurie'. A preparative to mariage; of the Lords Supper; of usurie. Amsterdam: Theatrum Orbis Terrarum, 1975. (hc q_e2_ir_serm_smith)

Statutes VII. 1695–99. The Statutes of the Realm. Printed by Command of His Majesty King George the Third in Pursuance of an Address of the House of Commons of Great Britain, Vol. VII. London: Dawsons of Pall Mall. (helsinki q_e3_sta_law_stat7)
Taylor, Joseph. 1705. A journey to Edenborough in Scotland. (archer 1705tayl.j2)
Trotter, Catherine. 1701. Love at a loss, or, most votes carry it. Ed. E. L. Steeves. The plays of Mary Pix and Catharine Trotter, Vol. II. (archer 1701trot.d2)

11 Picking an argument: politicians' choice of persuasive strategies

Geoff Thompson

11.1 Introduction

Political speeches are of great interest to discourse analysts since they represent one of the most overt ways in which socio-cultural ideologies are projected, and they are a prime example of the persuasive use of language. They also raise an issue that is directly relevant to the topic of how choice in language may be modelled. Such speeches are carefully crafted texts which are designed not only to be persuasive but also to reflect the (normally equally carefully crafted) persona of the politician; and thus originality and a distinctive 'voice' are prized. This suggests that variation in the linguistic choices may be greater than in registers (such as academic science discourse or hard news reporting) where conventional patterns of choices seem to play a greater role. How far is it then possible to see the speeches as construing an identifiable register? In Systemic Functional Linguistic (SFL) terms, registers are envisaged as intermediate regions on the cline of instantiation between the system potential (the 'whole' lexicogrammar) at one end and the instance (a single text) at the other. A register represents recurrent patterns of choice from the system found in texts in the environment of recurrent and culturally recognisable situations (see e.g. Figure 1.11 in Halliday & Matthiessen, 2004:28). The speeches that I will analyse are instantly recognisable as political speeches. This indicates that there must be identifiable recurrent patterns of choice at some level; and yet, as the following discussion will make clear, there are also marked differences in the persuasive strategies which are deployed by different politicians. The variation is reflected particularly in the area of conjunctive relations, which are the focus of this chapter; and thus this area appears to be worth investigating in order to explore the extent and effect of the variation, as a basis for considering the implications for the SFL model of register.

There has been a good deal of research on certain linguistic aspects of political speeches, from more pervasive features such as the use of pronouns (e.g. Wilson, 1990) or metaphor (e.g. Charteris-Black, 2006), to specific features such as Simon-Vandenbergen's (2000) study of the use of *I think*. Wilson (2003) provides a very useful survey of the areas which have been explored,

while van Dijk (2006) illustrates briefly a wide range of approaches to analysis. However, conjunctive relations have received little attention, perhaps because there is an overlap with approaches based more broadly on rhetoric, where the focus is typically on larger-scale segments of discourse (as in, for example, the pragma-dialectical approach proposed by van Eemeren & Grootendorst, 2004). Yet the ways in which politicians choose to connect messages to the messages before and after as the speech unfolds clearly play a central part in realising the speakers' decisions about how to develop their ideas and thus in constructing the kind of persuasive appeal at which they are aiming.

In this chapter, I report on an investigation of the patterns of conjunction in a small corpus of political speeches, relating these to the rhetorical strategies that they contribute to realising. The aim is first to present evidence that political speeches exhibit overall profiles of conjunctive choices which differentiate them from other registers such as casual conversation or fictional narrative, and then to explore the kinds of variation that emerge in the discoursal tactics chosen by individual speakers. The final step is to discuss the theoretical issue of how such individual variation can be accommodated in the Systemic Functional Linguistics notion of register, which assumes a degree of homogeneity of linguistic choices as a distinguishing characteristic of any one register.

11.2 The model of analysis

In order to explore the choices made by politicians in establishing and signalling connections between their messages, it is first necessary to set out the system of potential choices which are open to them.

Within Systemic Functional Linguistics, one recognised categorisation of conjunctive choices is in terms of semantic relations, which can be divided into four main categories: addition, comparison, cause and time, each with sub-categories (see Martin, 1992, Chapter 4, for the arguments in favour of this taxonomy). In addition, it is generally accepted that, cutting across these categories, a distinction can be made between what Halliday and Hasan (1976) call 'external' and 'internal' conjunction (see also Martin, 1992, for a more fully developed account). In the SFL model, external conjunction is viewed as constructing relations between states of affairs in the world, whereas internal conjunction sets up relations between discourse segments. The difference is illustrated in examples (1) and (2) (the name tags following the examples below indicate the politician from whose speech the example is taken):

(1) *First* we were told that we needed to pass the health care bill to see what's in it and now that we've seen what's in it, the Obama administration is handing out hundreds of waivers. [PALIN]

(2) We need to renew the Patriot Act because it strengthens our national security in four important ways. *First*, we need to renew the critical provisions of

> the Patriot Act [to] authorize better sharing of information between law enforcement and intelligence. [BUSH]

In (1), *first* signals sequence in external time: it indicates the order in which events in the political world happened (with the next step in time signalled by *and now*). In (2), on the other hand, *first* signals the text-internal sequence in which Bush will present the *four important ways*: the ordering of the four is dictated by considerations such as rhetorical weight, and in principle it would be possible to change the sequence without affecting the propositional content of the message. In addition to this kind of textual sequencing, other relations whose function is to establish connections between discourse segments include preview–detail and generalisation–exemplification.

However, closer examination suggests that the internal set of relations can usefully be divided into two major groups. Within SFL, the focus has mainly been on instances like (2), which are to do with signalling the organisation of text. On the other hand, in approaches from pragmatics (e.g. van Dijk's, 1977, distinction between 'semantic' and 'pragmatic' conjunction) most attention has been directed towards contrasting uses of conjunctive resources such as the ones illustrated in (3) and (4):

(3) But I am not satisfied: *so* I am asking the new independent climate change committee to report on whether the 60 per cent reduction in emissions by 2050 . . . should be even stronger still. [BROWN]

(4) I'm eighty in a couple of weeks and er when you get to my age you begin looking at things in a slightly different way *so* will you forgive me. [BENN]

Here the difference is in the type of causal relation signalled by *so*. In (3), we are told of the speaker's reaction (*not satisfied*) and the conscious step which he took as a result (an external reason–action relation). In (4), on the other hand, we have a factor (old age) which provides the motivation for the speaker to appeal to the audience for forgiveness (for reminiscing about the past). This second relation is therefore grounded not directly in the external material world, as in (3), but in the interpersonal semiotic domain of the ongoing interaction. Sweetser (1990) argues that such relations are in what she terms the speech-act domain, while Davies (1979) calls this kind of relation the 'reason for telling': the first clause functions as a justification of the speech act of request in the second clause. Certain other relations, such as concession–assertion, also function in the speech-act domain, in that they enact both parts of a dialogue in one speaker's utterance (what a speaker concedes is what someone else – often the addressee – has just said or is likely to think).

Sweetser and Davies also recognise a related type of internal conjunction, where the relation is grounded in the modal assessment of the speaker; see (5):

(5) He [Lord North] was the British prime minister who lost us America. *So* just think, however many mistakes you'll make, you'll never make one that bad. [BLAIR]

Blair is recounting what his son said to him when he became Prime Minister. The first sentence offers the evidence on which the son bases his reassuring prediction that *you'll never make [a mistake] that bad*. For Davies, this is the 'reason for knowing'.

Having distinguished these two 'pragmatic' uses of conjunction, corresponding to mood (speech function and exchange structure) and modality in the SFL model of interpersonal meaning, it is in fact possible to take a further step, and to bring into the picture a third main area of interpersonal meaning, appraisal (Martin & White, 2005). In (6), there is a pragmatic relation in the area of causation between the clauses in the final clause complex, which could be made more explicit by replacing the colon with *because*:

(6) Some say, hit Labour harder and the electorate will come to their senses. I say that's rubbish: people know that Labour have failed. [CAMERON]

As with (5), the causation is not external. The fact that *people know that Labour have failed* does not function to cause *that* (some other people's opinion) to be *rubbish*; it is the basis for Cameron's evaluation. To complete the triad started by Davies, this kind of relation might be termed the 'reason for feeling'.

In terms of the three metafunctions on which the SFL model is based, the kind of relation illustrated in (2) is best seen as operating in the textual domain: it structures the argument through discourse-internal time. On the other hand, (4), (5) and (6) are clearly interpersonal in nature: the first is related to speech function, the second to modality, and the third to appraisal.[1] This opens the possibility of mapping the types of conjunctive relations onto the three metafunctional domains, resulting in the tri-functional model of conjunction outlined in Table 11.1, with further examples from the data.

With this division established, the four categories of expansion proposed by Martin (1992) can be brought into the picture. As mentioned above, the two ways of viewing conjunction are complementary: in principle, any of the categories may manifest itself in any of the three metafunctional domains. Table 11.2 shows the intersections in grid form, with an example of a conjunctive relation from each category. It can be seen that, at the least delicate level, all the cells in the matrix can be filled, with the exception of a single semiotic 'gap': there do not appear to be any conjunctive relations at the intersection of 'interpersonal' and 'temporal'. The expansion category labels are taken from Martin (1992:179); and conjunctive signals have been added in square brackets to some of the examples to clarify the relation.

[1] Martin and Rose (2003:120) argue explicitly that the resources of internal conjunction as they view it "have evolved particularly in written text". This is true, but only of what I am here categorising as conjunction in the textual domain. The uses of conjunction in the interpersonal domain are in general far more characteristic of spoken discourse (which is why they have been of particular interest in pragmatics). This adds strength to the case for differentiating the two.

Table 11.1. *Tri-functional conjunction*[a]

Experiential	Interpersonal	Textual
connects figures in a complex representation and/or sequence	connects moves in an unfolding interaction	connects steps in an unfolding argument
e.g. cause–effect: *Because we work longer hours, commute farther, we spend less time at home and with our children*. [KENNEDY]	e.g. concession–speech act: *I know this is kind of late, but sorry*. [BLAIR]	e.g. preview–detail: *The Patriot Act has accomplished exactly what it was designed to do: it has protected American liberty.* [BUSH]

[a] In SFL, a major division in types of relations between clauses is set up between projection (roughly equivalent to 'reported speech' in traditional grammatical descriptions) and expansion (all other relations, such as cause−effect) – see Halliday (1994a:219). Table 11.1 relates only to expansion, since in the data for the present study, projection is a relatively small motif in the lexicogrammar of this register.

It is worth making explicit at this point that conjunction is analysed in relations both between clauses in a sentence (intra-complex) and between sentences (inter-complex). There are certainly differences in the frequencies of certain relations in intra- and inter-complex contexts: for instance, textual sequencing is strongly – though by no means exclusively – associated with inter-complex contexts. However, there appears to be no sound basis for setting up different categories – the same relations are found in both contexts.

This has of necessity been a somewhat sketchy overview of the model of choices in construing conjunctive relations which are open to the politicians delivering the speeches that are analysed (or, in the majority of the cases, to the speech writers preparing the speeches for the politicians). A full exposition of the model, with all the sub-categories exemplified and explained, is provided in Thompson (forthcoming).

11.3 The data

The study of political rhetoric reported on here is part of a larger investigation into patterns of conjunction across six contrasting registers (Thompson, forthcoming). In addition to the speeches, the project includes casual conversation, personal blogs, company reports, academic research articles and romantic fiction. The overall aim of the study is to investigate empirically Halliday's (1994a:338) claim that "different registers vary both in their overall use of conjunction and in their orientation towards that of an internal or external kind" (or, in the terms of the present study, their orientation towards conjunction in the three metafunctional domains). For each of the six registers, the data consists of a core corpus, comprising relatively long continuous extracts of text (ranging

Table 11.2. *Metafunction and semantic relations*

	Experiential	Interpersonal	Textual
Additive	e.g. simple addition: *This is a long war, and we have a comprehensive strategy to win it.* [BUSH]	e.g. aside: *Tony Blair can't. God knows he's tried hard enough.* [CAMERON]	e.g. specification: *Other changes are driven by demography. [That is] As a society we are getting older.* [KENNEDY]
Comparative	e.g. similarity: *The terrorists are patient and determined. And so are we.* [BUSH]	e.g. denial–counter: *I'm not talking about some slick rebranding exercise [as you might think]. What I'm talking about is fundamental change.* [CAMERON]	e.g. otherness: *Some changes are generational. [On the other hand] Other changes are driven by demography.* [KENNEDY]
Temporal	e.g. simultaneous: *Sometimes when I have been down you have lifted me up.* [OBAMA]	–	e.g. sequencing: *Four steps to a better economic future. One. Action to stop unjust repossessions.* [KENNEDY]
Consequential	e.g. cause–effect: *women around the world suffering because they no longer have access to reproductive care.* [CLINTON]	e.g. motivation–speech act: *And who is the man standing in the way? Gordon Brown, the great roadblock. [So] How are we going to stop him?* [CAMERON]	e.g. concluding: *there is no longer a single family structure in Britain in which a father works and a mother stays at home. [Thus] Families now defy a rigid definition.* [KENNEDY]

from 800 to 1,300 words). In each corpus, the extracts were analysed using Mick O'Donnell's UAM CorpusTool (http://www.wagsoft.com/CorpusTool/), until a total of just over 1,000 analysed relations was reached.

The extracts from political speeches are drawn equally from American and British sources: two US presidents (George W. Bush and Barack Obama); two UK prime ministers (Tony Blair and Gordon Brown); prominent party members not, at that point, in power (from the US, Hillary Clinton and Sarah Palin, from the UK, David Cameron and Charles Kennedy); and two people who, in different ways, exemplify politicians from outside the mainstream in each country (Ralph Nader and Tony Benn). The speeches were delivered between 2002 and 2009, on occasions such as party conferences, election rallies, protest meetings or meetings of special interest groups (e.g. the Planned Parenthood Federation). They were thus prepared speeches (rather than, for example, extemporary exchanges in parliament), delivered to an immediate audience that could be expected to be broadly sympathetic to the views expressed. The fact that they

were delivered in different contexts by speakers of different status undoubtedly has an impact on the discourse choices, and may well be a factor in the variation that emerges. Yet the texts are all immediately recognisable as political speeches, suggesting that any variation is within registerial configurations of choices that are in principle definable.[2] This still leaves open the question of how much variation is possible within a register, and how such variation can be accounted for in the SFL model – a question to which I return in the concluding section of the chapter.

11.4 Political rhetoric

The primary focus in the present study is not on evaluation of effectiveness but on exploring the linguistic mechanics of how political speakers choose to connect the ideas in their speeches. Nevertheless, the rhetorical purpose of the speeches clearly drives many of the choices, and cannot therefore be left out of the picture. One important issue is how to connect the clause-by-clause linking with this wider purpose. In order to do this, it is useful to call on traditional accounts of the choices that may be taken up in speeches.

In studies of rhetoric, it is generally argued that the main persuasive resources available to the speaker are *logos* (the use of logical argument supported by evidence, appealing to the audience's reason), *pathos* (the evoking of feelings on the basis of shared values and attitudes, appealing to the audience's emotions), and *ethos* (the projection of the speaker as authoritative, knowledgeable, honest, likeable, etc.). Focusing in on conjunction as one important aspect of how these appeals are realised linguistically, it would seem likely that recourse to logos will be reflected in the setting up of relations in the experiential domain, for example arguing from cause to effect, and in the textual domain, for example arguing from premise to conclusion or signalling the sequencing of arguments. Recourse to pathos, on the other hand, may be reflected in relations in the interpersonal domain, constructing the discourse as dialogic, showing awareness of and consideration for the audience's views, including putting forward congenial opinions and evaluations and showing why they are justified. Ethos is constructed by effective deployment of the two other strategies: authority and knowledge projected by well-grounded argumentation, and trustworthiness and likeability projected by the establishment of solidarity.

[2] In an informal test to support this claim, I presented two native speakers of English with thirty-six short extracts of around two to three lines of text from the six registers in my data, having removed as far as possible surface features which might help identification (e.g. spoken extracts were punctuated as if they were written). I asked them to identify as precisely as possible the register to which each extract belonged. All six extracts from political speeches were correctly identified, and no other extracts were wrongly identified as taken from political speeches.

The study reported here set out to investigate how far politicians exploit different choices in conjunction in their speeches, first looking, fairly briefly, at the extent to which the overall patterns appear to be distinctive in comparison with the other registers analysed, and, in greater detail, exploring the extent to which individual speakers might produce different patterns of choices which construe different approaches to the construction of persuasive rhetoric – while still realising what can be regarded as instances of a single register.

11.5 Patterns of conjunction in political speeches

11.5.1 Cross-register comparison

This section will briefly illustrate some of the evidence for the argument that conjunctive patterns are different in different registers, and demonstrate the distinctiveness of political speeches in comparison with the other registers included in the larger project.

Figure 11.1 shows the results at the least delicate level in terms of metafunctional domain (for inter- and intra-complex relations combined). The figures for each register are percentages of the expansion relations in each corpus (the raw frequencies are between 812 and 920 relations per register). The 'ALL' column gives the overall percentages for the six registers combined (5,190 relations in total).

At this level of generality (with, it should be borne in mind, any individual differences within a register averaged out), political speeches are closest in profile to the overall average, with academic journal articles and, especially, romantic fiction being the least similar (fiction in fact turns out to be the most distinctive register, showing markedly different patterns from all the other registers on nearly all counts). Speeches have a rather similar pattern to personal blogs, but the relative proportions of interpersonal and textual relations are reversed, with speeches having a greater proportion of textual relations. This suggests that the speakers may be slightly more concerned with using conjunction to structure their speeches than to project the discourse as dialogic. One possible factor is that speeches are generally carefully crafted, and the organisation has to be maintained over longer stretches of discourse than in blogs or conversation. It is perhaps significant that the profile of textual being more frequent than interpersonal relations is shared with the two registers which show most clearly features of the written medium, academic articles and company reports. The relatively low proportion of relations in the interpersonal domain in comparison with those in experiential and textual domains could be seen as grounds for a preliminary interpretation that, at least as far as conjunctive resources are concerned – and these are, of course, only a very small part of the picture – the politicians appear to be more oriented towards

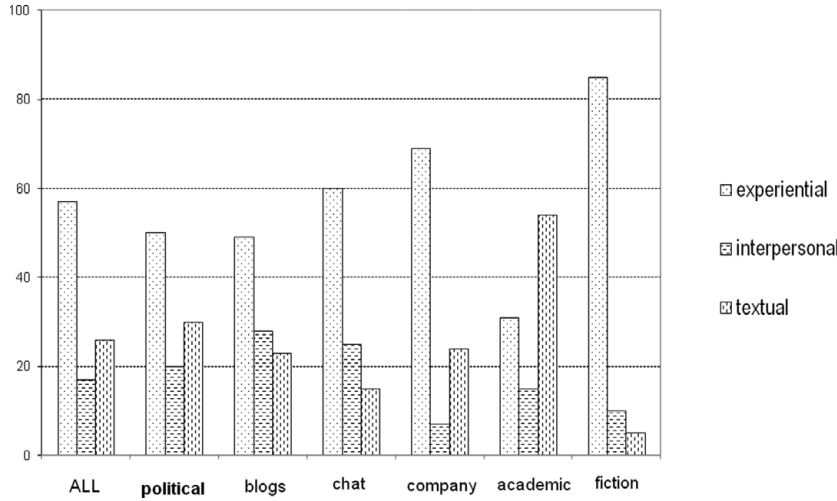


Figure 11.1. Conjunction in political discourse and other registers: metafunctional domain

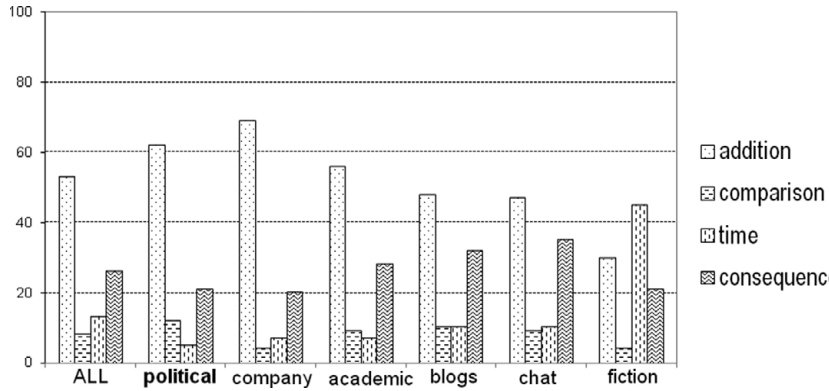


Figure 11.2. Conjunction in political discourse and other registers: expansion type

logos than towards ethos (in fact the more delicate analysis below shows that this is an oversimplification). Nevertheless, it is also worth highlighting the fact that political speeches share with blogs and casual conversation a higher than average proportion of relations in the interpersonal domain across the registers as a whole.

Still at a very general level, Figure 11.2 shows the proportions for the four categories of expansion.

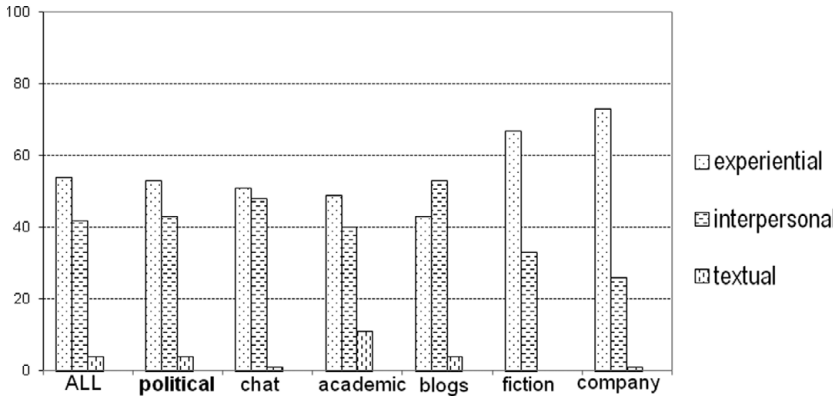


Figure 11.3. Conjunction in political discourse and other registers: consequence x metafunction

With the exception of fictional narrative (the only one in which, unsurprisingly, time relations are the dominant category), the registers all show a degree of similarity in their overall profiles, with addition the most frequent type, followed by consequence, although with varying proportions between the two; and with comparison and time occurring markedly less frequently. From this perspective, it is company reports and, to a lesser extent, academic articles which are closest in profile to political speeches, rather than blogs and chat. In particular, the heavy predominance of additive relations in speeches is a feature that is potentially revealing to investigate in more detail.

As an example of inter-register comparison at a slightly more delicate level, Figure 11.3 shows the profiles of consequence relations in the three metafunctional domains. The raw frequencies are lower here, ranging from a total of 173 occurrences in fiction to 281 in casual conversation, with political speeches (186 instances) nearer to the lower end of the scale.

As with the overall metafunctional profiles (Figure 11.1), political speeches match the combined profile very closely, with, this time, casual conversation as the most similar of the other registers. It is worth noting that in speeches (as in conversation, academic writing and blogs) consequential relations in the interpersonal domain are not very different in proportion from those in the experiential domain. This suggests that the politicians may be devoting some of their speeches to justifying their opinions and speech acts, which is the main function of interpersonal consequence relations (though it needs to be borne in mind that these make up only around 10 per cent of the total of 1,000 relations).

What the illustrative profiles suggest is that the registers are indeed different in the ways in which they deploy conjunctive resources. This is confirmed

by other comparisons not shown here: tests show that, wherever there are large enough figures for calculations to be feasible, the differences across all registers are statistically significant at the 0.001 level; and the differences between political speeches and each of the other registers are also statistically significant in most cases. The profiles of conjunction in political speeches across various systems of choices build up to a distinctive set. The speeches tend to be relatively close to the overall average on a number of the measures; and they exhibit profiles that are similar to different registers when different features are examined: in some ways they resemble unplanned discourse (casual conversation and personal blogs), while in others they are closer to planned, written text (company reports and academic articles). This appears to be at least partly a reflection of their intermediate status in terms of mode: although there is evidence of variation in the extent to which they are scripted, they combine written medium with phonic channel (see Berry, this volume).

11.5.2 Patterns of choice by individual speakers: quantitative analysis

In this section, I narrow the focus to look at the individual speeches in the political corpus. To start with, I will provide a brief overview of the quantitative findings for some of the least delicate sets of choices in the ten speeches. These are intended as a basis partly for the selection of a small number of the speeches to investigate qualitatively as representing certain potentially interesting features that emerge, and partly for the subsequent discussion of the variation that occurs in individual speeches – a variation that is inevitably masked in the overall total used in Figures 11.1 to 11.3. In the following figures, the sample consists only of around 100 relations for each speaker, and quantitative comparisons cannot therefore be pushed very far. It should also be stressed that the results for the speeches in the sample may or may not be representative of other speeches by the same speakers (though all sound intuitively characteristic of the speakers). Figure 11.4 shows the percentage results for each of the ten speakers by metafunctional domain.

The speeches are ordered across the graph in terms of proportion of choices in the experiential domain, from the lowest (Blair) to the highest (Obama). As can be seen, there is a considerable amount of variation around the combined distribution ('ALL'); but two main groupings can be identified, with Blair, Benn and Brown using roughly equal proportions of relations in the experiential and textual domains, while the other seven speakers all use a markedly higher proportion of relations in the experiential domain. Within this latter group, all except Kennedy and Obama show roughly equal proportions of the textual and interpersonal categories. These results are inevitably very broad-brush, and they need to be treated with caution since the samples for each speaker are small; but they suggest that it may be revealing to compare in more detail the

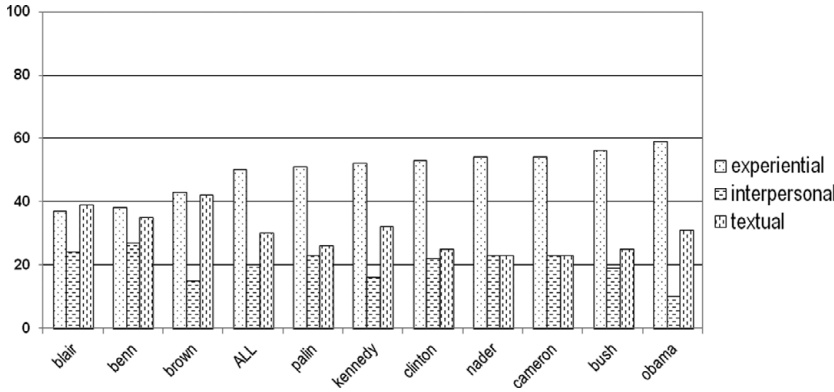


Figure 11.4. Conjunction in political speeches: metafunctional domain

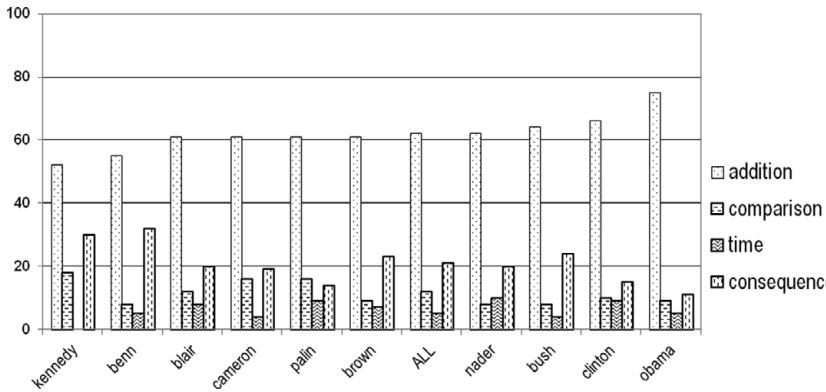


Figure 11.5. Conjunction in political speeches: expansion type

discourse of Blair and Obama, since they are the most different – particularly in that Blair is one of the group that uses the highest number of relations in the interpersonal domain, whereas Obama uses this type least frequently.

Figure 11.5 shows the results in terms of the distribution across the four major categories of expansion, this time ordered by the proportion of addition relations since these are the largest group for all speakers.

The distributions have similar overall profiles: addition > consequence > comparison > time (with the exception of Nader, where time > comparison; but the raw frequencies are so low that little weight can be placed on this). The speakers share the characteristic of relying heavily on additive relations: this may therefore be a distinctive feature of the register (it will be recalled

that Figure 11.2 shows that only company reports have a higher proportion of addition relations). However, the proportions of addition to consequence in particular vary fairly considerably. As in Figure 11.4, Obama is at one extreme of the ordering, with a markedly high predominance of addition relations, again suggesting that his discourse will be worth exploring qualitatively: he appears to be deploying the conjunctive resources in a relatively individual way. Kennedy and Benn stand out to some extent because they rely more than the others on consequence relations, suggesting that more overt argumentation is being used in their speeches, perhaps with the implication that they are more oriented to an appeal through logos.

11.5.3 Patterns of choice by individual speakers: qualitative analysis

I now turn to a qualitative analysis of the ways in which choices in conjunction function in sequence as the discourse unfolds. There is no space to discuss all the speeches, but the brief quantitative sketch above has indicated that the speeches from Obama and Blair contrast in ways that are worth exploring. Kennedy can also be seen as contrasting with Obama in the use of different categories of expansion; and a preliminary qualitative analysis shows that Bush, whose overall patterns of choice do not generally stand out as distinctive, illustrates a way of using conjunctive resources that is unlike these three others. The analysis will therefore use these four as representative of the kind of variation that occurs. In each case, I will focus on an extract that as far as possible exemplifies recurrent features of conjunction in the speech as a whole.[3]

Of the four, the speaker whose profile indicates, particularly through the relatively frequent exploitation of consequence relations, the possibility that he is relying fairly heavily on the appeal through logos is Kennedy. To give a flavour of the speech, Table 11.3 shows a short extract with the analysis of conjunction in the right-hand column (only inter-complex relations have been analysed, in order to bring out the main line of development more simply). In the labels for the relations, 'e' indicates experiential, 'i' interpersonal and 't' textual. Matched arrows link the two clauses which enter into the relation. When the relation has only one clause labelled, as with 'rewording' or 'adding', the symbol '–' marks the clause which is being reworded, added to, etc. The speaker is talking about the alienation from their society that most people in the country feel because 'control over our lives has been lost'.

[3] The four speeches are available online:
<http://www.guardian.co.uk/politics/2005/oct/31/speeches.liberaldemocrats>
<http://www.cnn.com/2003/US/07/17/blair.transcript/>
<http://www.presidentialrhetoric.com/speeches/06.09.05.html>
<http://obamaspeeches.com/E-Barack-Obama-Speech-Manassas-Virgina-Last-Rally-2008-Election.htm>

Table 11.3. *Charles Kennedy speech*

(a)	This alienation is fundamental to the problem of crime, especially low level crime and antisocial behaviour.	↓*i-appraisal*
(b)	Crime is easier if the victim is anonymous, and if there is no community to censure criminal behaviour.	↑*i-basis* /↓*e-matched*
(c)	And punishment is easier if the criminal is anonymous.	↓*i-basis* /↑*e-similar*
(d)	We become wary of giving them a second chance because we do not truly believe they can be rehabilitated, or at least we feel it is not worth taking the risk.	↑*i-appraisal* /↓*e-cause*
(e)	This fuels the cycle of reoffending, which is now at record levels.	↓*i-basis* /↑*e-effect*
(f)	Britain is in danger of being locked into spiral of distrust, spurred on by a sensationalist media and senior politicians pandering to populism.	↑*i-appraisal* /↓*e-cause*
(g)	Unless we are careful we are likely to withdraw further into our private worlds, relying on the police to respond and the state to provide all the answers.	↓*i-motivation* /↑*e-effect*
(h)	We need to change this.	↑*i-speech act*/–
(i)	We need to rebuild our society.	↓*i-speech act* /↑*t-rewording*
(j)	Cohesive and trusting societies have lower levels of crime.	↑*i-motivation*

This is an almost classic example of logical argumentation, drawing almost exclusively on consequential relations in the experiential and interpersonal domains; and it is representative of the rest of the speech. The speaker exploits many of the available choices for construing argumentation. When claims are advanced, they are supported by interpersonal justifications: for example, the assessment in (a) that the alienation which Kennedy has identified is *fundamental to the problem of crime* is justified in (b) and (c) by his contention that anonymity (which he has earlier shown to be a crucial aspect of the alienation) makes both crime and punishment *easier*. These moves function as the basis for experiential consequence relations of cause and effect, such as that between (d) and (e): our wary attitude to criminals *fuels the cycle of reoffending* (the relation here is lexically signalled by *fuels*). These are the key steps in the reasoning, building up to an interpersonal clincher in the final clauses, in which a course of action is recommended, with a final statement in (j) which is both a basis for his preceding recommendation and a useful sound bite summarising his argument. Despite the use of interpersonal consequence relations, designed to carry the audience with him as his argument unfolds, the overall impression is relatively 'cool': the main appeal is through logos, contributing to constructing his persona as deliberative and rational.

In comparison, the extract from a speech by Tony Blair shown in Table 11.4 is less obviously organised in a chain of logical reasoning (again,

Table 11.4. *Tony Blair speech*

(a)	The immediate threat is not conflict between the world's most powerful nations.	↓*i-appraisal–*
(b)	And why?	↑*t-adding*
(c)	Because we all have too much to lose.	↑*i-basis*/↑*t-specify*
(d)	Because technology, communication, trade and travel are bringing us ever closer together.	↑*t-adding*
	[3 more Because *complexes]*	↑*t-adding (x 3)*
(e)	We are bound together as never before.	↑*t-summary*
(f)	And this coming together provides us with unprecedented opportunity	↑*t-adding* /↓*i-expectation*
(g)	but also makes us uniquely vulnerable.	↑*i-contradiction*
(h)	And the threat comes because in another part of our globe there is shadow and darkness, where not all the world is free, *[3 more* where *clauses]*	↑*t-adding*
(i)	And because in the combination of these afflictions a new and deadly virus has emerged.	↑*t-adding*
(j)	The virus is terrorism *[2 clauses omitted]*	↑*t-specify*
(k)	This is a battle that can't be fought or won only by armies.	↑*t-adding* /↓*i-appraisal*
(l)	We are so much more powerful in all conventional ways than the terrorists,	↓*i-expectation* /↑*i-basis*
(m)	yet even in all our might, we are taught humility.	↑*i-contradiction* /↓*i-appraisal*
(n)	In the end, it is not our power alone that will defeat this evil.	↓*i-denial*↑*i-basis*
(o)	Our ultimate weapon is not our guns, but our beliefs.	↑*i-correction*

only relations between independent clauses or clauses signalled orthographically as independent are labelled, and the extract has been slightly shortened). The speech is about the new threat of terrorism, which Blair argues has replaced the traditional threat of war between nations.

The most obvious feature in the extract is the prevalence of textual addition: rather than relying on logical linking from one step to the next, Blair often builds ideas cumulatively, adding details and further points as he moves towards his conclusion (which, like Kennedy's, is an efficient sound bite). For example, in (e) he summarises the point he has just been making. This summary could be used as the basis for a following causal relation ('Therefore we have unprecedented opportunity'); but instead in (f) Blair resorts to textual addition ('and here is something else I want to say about the topic'). However, the main scaffolding of the speech is constructed by relations in the interpersonal domain: the extract illustrates a kind of organisation that recurs several times in Blair's speech, with addition relations framed by interpersonal 'topping and tailing'. The new topic is broached in (a) (though the audience is not yet told what the *immediate threat* is), and the grounds on which Blair bases the claim are set out in (c) and the following clauses, in an appraisal−basis relation.

Table 11.5. *George W. Bush speech*

(a)	This is a long war,	
(b)	and we have a comprehensive strategy to win it.	↑*e-additive*
(c)	We're taking the fight to the terrorists abroad, so we don't have to face them here at home.	↑*t-specify*
(d)	We're denying our enemies sanctuary, by making it clear that America will not tolerate regimes that harbor or support terrorists.	↑*t-adding*
(e)	We're stopping the terrorists from achieving the ideological victories they seek by spreading hope and freedom and reform across the broader Middle East.	↑*t-adding*
(f)	By advancing the cause of liberty, we'll lay the foundations for peace for generations to come.	↑*t-concluding*
(g)	And one of the great honors as the President is to be the Commander-in-Chief of a fantastic United States military made fantastic by the quality and the character of the men and women who wear the uniform.	↑*t-adding*
(h)	Thank you for serving.	↑*i-aside*
(i)	As we wage the war on terror overseas, we'll remember where the war began – right here on American soil.	↑*t-adding*
(j)	In our free and open society, there is no such thing as perfect security.	↑*t-adding*

Having outlined the reasons why the new threat has arisen, and specified it as terrorism, the section is rounded off in (k)–(o) with a series of relations in the interpersonal domain, including two – expectation−contradiction and denial−correction – which enact the speaker taking account of the audience's beliefs in order to adjust them (e.g. it is the audience who are represented as potentially believing that *our power alone* is enough). This chimes in with the fact that in (b) the speaker signals the interpersonal appraisal−basis relation explicitly by a question which is asked as if on behalf of his audience. The overall effect is thus that the speaker is relying at key points on pathos, in the form of overtly interacting with, and accommodating the beliefs of, his audience. The frequent use of addition relations may at first sight make the text appear somewhat loosely structured, but the overall effect is of purposeful progression from stage to stage, with audience engagement at the transitions and climaxes. This broadly matches Fairclough's (2000:105) characterisation of Blair's speeches: for example, he comments on the way in which Blair exploits 'shifts into a more vernacular, everyday style [which] are also shifts into a more interactive style – Blair is engaging with the audience'.

Addition relations are also very frequent in George W. Bush's speech, with a rather different effect – see Table 11.5. Like Blair in the preceding extract, he is talking about combating the threat of terrorism.

There are experiential consequence relations in this stretch, but they are within complexes (e.g. there is an action−reason relation signalled by *so* in (c); and (d) includes an end−means relation signalled by *by -ing*). They therefore

do not contribute directly to the progression of the discourse, which is mainly effected by textual addition relations. Some of these occur within the scope of another relation: for example, (d) and (e) add to (c) further specification of the *comprehensive strategy* mentioned in (b). Others, however, operate at a higher level, bringing in main points made in the speech, sometimes in apparently random order. For example, (g) and (h) express praise in a formulaic way expected in this kind of speech, but there is little attempt to fit them smoothly into the discourse: they are unconnected with the utterances around them and could equally well have appeared at a number of other places in the speech. What seems to be the underlying organisation of this section of the speech – an account of what the US is doing to combat terrorism abroad, in (c)–(f), and at home, from (i) onwards – is reasonably clear, but the precise nature of the relations is sometimes harder to determine. For example, in (j) Bush starts to talk about the problems of maintaining security in *our free and open society*; however, there is nothing specific in (i) which can be seen as leading towards that topic. The effect is of a string of points all in the same topic area but with the connections often not spelt out: the audience is expected to see the relevance of each point, but there is little overt signalling of the underlying organisation. It can perhaps be hypothesised that this reflects a possibly deliberate attempt – in line with the persona that Bush is generally credited with constructing – to sound down-to-earth, non-intellectual and 'a regular guy' (Waldman 2004:1), by avoiding the impression that the speech has been crafted. This would be an appeal to a particular type of ethos which depends on appearing to be the kind of ordinary person who does not resort to rhetorical devices (in itself, of course, this is a rhetorical device).

Barack Obama's speech, like Bush's, is once again marked by a very frequent use of addition relations, mainly in the textual domain; but again the overall effect is different – see Table 11.6.

In terms of conjunctive relations, there is not in fact very much that can be said about this extract: the speech proceeds by accretion, adding one increment at a time. This is true even within complexes: the sequences of three postmodifying embedded clauses in (b) (*that invest . . . create . . . and grow*) and (e) (*that would divide . . . that puts . . . that asks*) are based on a structure of simple addition relations. What differentiates this pattern from the addition relations in Bush's speech is the syntactic parallelism (e.g. *tomorrow you can . . .*) that binds the complexes together: conjunction does relatively little of the cohesive work here. Each increment is designed to be more 'intense' in some way than the one before: for example in (g)–(i) the importance of the immediate location and audience is increasingly foregrounded, ending with a rewording which is intended to provide a resonant clincher. The basic organisation is, of course, the rhetorical triplet or tricolon, a special application of addition relations; unlike Bush, Obama is unabashed in his use of rhetorical devices. The effect is in a

Table 11.6. *Barack Obama speech*

(a)	Tomorrow you can turn the page on policies that put greed and irresponsibility before hard work and sacrifice.	
(b)	Tomorrow you can choose policies that invest in our middle class, create new jobs and grow this economy so that everybody has a chance to succeed.	↑*t-adding*
(c)	Not just the CEO but the secretary and the janitor;	↑*t-specify*
(d)	not just the factory owner but the men and women who work the factory floor.	↑*t-adding*
(e)	Tomorrow you can put an end to the politics that would divide a nation just to win an election; that puts reason against reason, and city against town, Republican against Democrat; that asks us to fear at a time when we need to hope.	↑*t-adding*
(f)	Tomorrow, at this defining moment in history, you can give this country the change that we need.	↑*t-adding*
(g)	It starts here in Virginia.	↑*e-additive*
(h)	It starts here in Manassas.	↑*t-specifying*
(i)	This is where change begins.	↑*t-rewording*

sense the opposite of that of Kennedy's speech. Rather than appealing to reason by deploying consequence relations, Obama relies on pathos: Ivie and Giner (2009:280), for example, refer to his 'inspirational rhetoric'. Like an earlier presidential candidate, Jesse Jackson (Tannen, 1989:194), he appears to be drawing to some extent on the traditions of African American sermons, using repetition in particular ways in order to appeal to his audience's emotions.

The four speeches can thus be seen as deploying conjunctive resources in very different ways: in somewhat crude terms, the speakers might be characterised as choosing to reason logically to a conclusion (Kennedy), coax the audience interpersonally to a conclusion (Blair), wander informally through a topic (Bush), and amplify repetitively to a climax (Obama). These do not by any means exhaust the possibilities open to political speakers, but the patterns do recur in at least sections of the other speeches in the data, and they clearly represent a considerable amount of the variation that one would intuitively expect. However, this variation raises potentially difficult issues for the notion that there are distinctive configurations of choices in political speeches which differ systematically from those of other registers. These issues will be addressed in Section 11.6.

11.6 Choice: register and instance

In principle, choice (in this case, between the various systemic options for construing the connections between clauses, although the distinction applies to all systems) can be seen as operating at two main levels. The first is choice

which reflects the general conventions of the register. As has been argued above, conjunction, like other lexicogrammatical systems, is sensitive to register; and, at this level, the choices made by the politicians can be seen as largely unconscious selections from the overall meaning potential of the language. These selections rest on mostly unspoken assumptions about how political life is conducted discoursally in Western society, and result in texts which are recognisable as examples of political speeches. The second relates to the largely conscious choices, within the overall register patterns, which individual speakers make in constructing their arguments with an orientation towards logos, pathos or ethos (or a combination). In somewhat oversimple terms, this distinction between levels is between choice as constraint and choice as freedom (within constraint). The use of the term 'constraint' should not be taken as implying that I see the context as determining the language used: I fully adhere to the view that language and context are interdependent, and that by making certain choices speakers construe the context as being that of a political speech rather than, say, a presentation at a research conference. However, in order to construe such a context within the socio-cultural conventions in which they live, speakers need to make certain linguistic choices and not make others: if they do otherwise, they will either be construing a different context or attempting to reshape the conventions (which would probably be a risky strategy – see Bartlett, this volume, on the conditions necessary for such reshaping to be possible).

The distinction may be represented in terms of the SFL cline of instantiation (Halliday & Matthiessen, 2004:28), which underlies the organisation of the present chapter. The focus has shifted from the system (the tri-functional model of conjunction presented in Section 11.2 above) to register (Sections 11.4 and 11.5.1), and then to instance (Sections 5.2 and 5.3). This can be seen as a shift from the choices that are available in the lexicogrammar as a whole, to the choices that are makeable in the context (i.e. those which are characteristic of the register, with the implication that certain choices which are available in principle in the lexicogrammatical system are unlikely to be made), to the choices that are made in any particular instance of a political speech.

However, as indicated above, it may appear difficult to reconcile the degree of variation noted at the level of speeches with the claim that there are registerially distinctive patterns of choice: the register patterns are, after all, merely the total of the individual speeches, with any variation smoothed out and thus masked. There are, though, a number of points which have to be borne in mind. First, it is the whole configuration of choices from all lexicogrammatical systems which characterises any register. Practical constraints mean that analyses such as the present study can typically focus only on one area and attempt to explore the contribution of that area to the overall configuration; but, while this makes certain insights possible because the phenomenon under study is

more manageable, it inevitably gives a partly distorted picture. Second, it is extremely unlikely that any single text from a particular register will exhibit all the patterns of choices which characterise that register. The key factor is the higher probability of certain (configurations of) choices being made (or not made) than in other registers; and for the linguist the relevant probabilities only emerge from the analysis of a corpus (Halliday, 1991). Assuming a corpus that is sufficiently large and registerially specific, the 'smoothed-out' total patterns can be taken as approximating the probability that certain choices will occur in that register. The actual occurrences in any individual instance of the register will realise the probabilities to a greater or lesser extent. The corpus used in this study is clearly small, because of the labour-intensive nature of the analysis (which has to be done manually), and thus individual texts may have a disproportionate effect on the totals; but the findings do, I would argue, give a reasonably accurate pointer to the patterns of probabilities which would emerge from a larger corpus. Finally, the fact that the speeches were delivered in different kinds of context, by speakers with different statuses in the political world, for different purposes, may mean that it would be better to treat them as realising different sub-registers within the broader register of political speeches. It is generally accepted within SFL that the movement from system to instance or vice versa is along a cline; and register – which, to avoid complicating an already complex picture, I have so far been treating as if it were a relatively fixed point on the scale – in fact covers a broad region of the cline. This has been partly formalised in some approaches by introducing the notion of text type as a further point on the cline between register and instance (see e.g. Martin & White, 2005:163); but it may be preferable to accept the idea of a continuum, with registers and the situation types that they construe more broadly or more narrowly defined depending on how far 'back' from the instance one moves. With a wide-angle analytical lens (and a large enough corpus), what comes most clearly into view are the configurations which distinguish one register from another. The closer the analyst is to the instance end of the cline, the more likely it is that individual choices, of the kind explored in Section 11.5.3 above, will be salient.

Equally importantly, the variations in the findings for individual texts also reflect something of the nature of political speeches. These are typically carefully constructed to have maximum impact; and part of the impact comes from distinctive choices which construe the kind of persona that the speaker wishes to project in that context. More value is placed on textual creativity and a personalised tone than in many registers, especially those such as news reports which are monitored by gatekeepers, part of whose task is to ensure a certain degree of discoursal uniformity, or those such as company reports where originality might be felt to be counter-productive. The fact that political speeches exhibit relatively wide variation in at least some areas of the lexicogrammar is

therefore predictable: it is part of the nature of this register – like other registers in which a high value is placed on originality or a personal voice, such as blogs – that certain features are less constrained by textual conventions and more accommodating to the enactment of individual choice. The present study suggests that conjunction is one of the areas where choice is freer. That does still, of course, leave open the question of what the criterial patterns of lexicogrammatical choices are which make all the extracts above instantly recognisable as political speeches.

Much of the work on register within the SFL approach has dealt with text types which tend to be policed and therefore more uniform, such as scientific research articles; in such cases, statements of general tendencies in lexicogrammatical choices can be made with a reasonable degree of certainty. What the present study of political speeches has highlighted is that descriptions of certain registers may need to find ways of taking account of acceptable areas and types of variation as well as regularities. This adds inevitably to the complexity, but should result in capturing more accurately and convincingly the character of those registers.

12 A dynamic view of choice in writing: composition as text evolution

Michael O'Donnell

12.1 Process and product perspectives on choice

During the 1980s, Systemic Functional Linguistics (SFL) was very much concerned with the application of the process/product duality to text: seeing text both as a process that we go through, and also as the thing produced by the process.[1] For instance, Halliday and Hasan (1985:10) said:

> The text is a product in the sense that it is an output, something that can be recorded and studied, having a certain construction that can be represented in systematic terms. It is a process in the sense of a continuous process of semantic choice, a movement through the network of meaning potential, with each set of choices constituting the environment for a further set.

I believe this quote has its basis in Halliday's involvement at that point with the Penman sentence generation system, run by Bill Mann and involving Christian Matthiessen. Halliday was a consultant and adviser to the project. The central task of this project was generating sentences, and in that context, the process of generation involved the left to right traversal of system networks (making choices within each system), and then the assembly of the realisations associated with the selected features (with potential recursion down the rank scale). Here, the choices are part of the process, and the product is the result of realising those choices.

However, most of the attention given to the process/product duality was in relation to the modelling of spoken interaction, such as teacher−student interactions (Berry, 1981) or service encounters (Ventola, 1987). Others also addressed dialogic interaction as process, e.g. Hasan (1981), Halliday (1984b), Martin (1985), Fawcett *et al.* (1988), O'Donnell (1990, 1999) and Yang (2010).

These works distinguished between approaches that described interactions in terms of their products (*synoptic* descriptions), and those which modelled interactions as process (*dynamic* descriptions). For instance, a synoptic description

[1] My thanks to the editors for valuable comments on an earlier version of this chapter, and also to Elizabeth Thompson for suggesting the line of research carried out here.

of an exchange would describe the possible move-sequences that might result, e.g. the feature selection *wh-exchange:compliant:no-feedback* would represent an exchange which consists of a wh-question, followed by the answer to the question, but no final feedback by the asker. On the other hand, a dynamic description of the exchange might represent the options to open an exchange (statement, question, request for action, etc.), and then the options available to follow each of these openings, and so on.

Despite the attention given to the process−product duality in SFL, it needs to be noted that little attention has been given to exploring the process side of *written* texts. There are real differences between the process of writing and the process of dialoguing. The biggest difference is that in speaking, what is said remains said: there is no backspace in the spoken world. In writing, we can delete text, change our wording, insert new text at previous points, or move text to earlier or later points. The process of writing thus offers fundamentally different choices to those we face in speaking.

As writing may involve deleting, inserting or changing text at any point of the text, the temporal sequences of choices made by a writer do not necessarily correspond to the linear sequence of words, or even sentences, within the final text. And where text is deleted, choices made in the writing of a text may not correspond to any text present in the final product.

While substantial attention is given to the teaching of writing in SFL (most noticeably in terms of 'Australian Genre Theory'), this work almost entirely takes a product orientation: students are presented with finished products, which are post-mortemised, and then the student is encouraged to emulate them.

The point of this chapter is that to truly understand how good texts come to be as they are, and to teach how to replicate them, we need to understand how they are produced: i.e. what is the process of writing good texts. We should be teaching the process, not the product.

This chapter thus explores the nature of text composition when viewed as a process of evolution of text, rather than starting from the viewpoint that a writer of a text conceptualises the entire text in one go, and then just sets it down on paper. I am thus contrasting a 'creationist' approach to text linguistics with what I consider more appropriate, an 'evolutionary' approach.

This view is not common within SFL. However, within the United States, a focus on the writing process has been emphasised since at least the 1970s, for instance in the work of Emig (1971), Murray (1972) and Perl (1979). Murray (1972:11) expresses his view in the following:

> Most of us are trained as English teachers by studying a product: writing. Our critical skills are honed by examining literature, which is finished writing; language as it has been used by authors. Then, fully trained in the autopsy, we go out and are assigned to teach our students to write, to make language live. . . . When we teach composition, we are not teaching a product; we are teaching a process. And once you can look at your

composition program with the realization you are teaching a process, you may be able to design a curriculum which works.

While I don't agree with all that this approach proposes, teaching writing as process rather than through the autopsy of products makes a lot of sense, and I believe the SFL approach to teaching writing could be much improved by this change of orientation. This would have consequences on many levels, but one instance would involve presenting a short incomplete text, and presenting to the students a number of ways to improve it. This might involve explicit teaching of rhetorical relations, or Martin's conjunctive relations, for instance how to improve the text by adding examples, purposes, evidence, rewordings, counter-expectation corrections, etc.

But before one can start to redesign the writing curriculum, it would help to understand how people actually do write: How do we set a text to paper (whether virtual or physical)?

To improve my own understanding of how we write, I undertook a study of the process of writing. I assumed that, to best understand this process, observation of how texts are developed, word-by-word, is essential. To this end, I collected (with Lise Fontaine) a corpus of texts using key-logging software. A number of writers were invited to compose a text online, and software recorded each keystroke, mouse movement, cut/paste, etc., as they occurred. The corpus of resulting 'dynamic texts' allows us to see how each text evolves, from the first character typed, up until the final pressing of the 'Submit' button.

Key-logging does have its limitations: we do not have access to the thoughts of the writer either before typing (the pre-planning stage) or during production. However, much can be deduced about the writing process by studying how the text unfolds, and how it is revised. We note that some studies use eye-tracking to provide further evidence as to what is going on in the speaker's mind at the time of writing, but, for the present study, we lacked the resources to collect this data.

This chapter will describe some of our conclusions in regard to the writing process reached by analysing this corpus. Section 12.2 will describe the corpus and its manner of collection. Section 12.3 will provide details of the general composing styles observed in the corpus: distinguishing those who write from first word to final word without any revision from those who use some sort of cyclical revision/expansion approach.

Section 12.4 will explore how well three proposals for discourse structures used within SFL hold up as explanations of how people organise their writing process: Generic Structure Potential (12.4.1; Hasan, 1978), Rhetorical Structure Theory (12.4.2; Mann and Thompson, 1988) and Thematic Progression (12.4.3; Daneš, 1974). Section 12.5 offers the conclusions I have reached from this study.

In Section 12.6, we will look at the consequences of the results of this study for the teaching of writing.

12.2 Collecting a process-oriented corpus

Key-logging only became practical with the spreading use of PCs in the later 1980s. Before this point, other methods were found to achieve the same ends. Sommers (1980), for instance, collected essays on paper and the revised versions of those essays so as to study the process of revision. Collier (1983) began the study of the writing process on computers, using video-recording of the computer screen during the writing process. The first attempt at actually logging keystrokes occurred soon after, for instance in the work of Lillian Bridwell-Bowles and colleagues (Bridwell *et al*., 1985).

Since then, a wide number of studies have used key-logging to study the writing process. For comprehensive summaries, see Abdel Latif (2008) or Sullivan and Lindgren (2006). The period has also seen the rise of several off-the-shelf key-logging packages, for instance, InputLog (Leijten & Van Waes, 2006), and ScriptLog.[2]

The rest of this section will outline the methodology we used to collect our own key-log corpus.

12.2.1 A Web page for collecting key-logs for text compositions

In May 2010, Lise Fontaine and I set up a Web page using forms which allowed people to write text into a provided space, and edit that text. Each keystroke was recorded, along with movement within the text using the mouse, and cut-and-paste events.

The instructions on the page included:

- Please write a short text (500 words or less) in the space below.
- *Do not* type the text in a word processor then paste it in here, as we are interested in how the text develops over time.

To capture a range of text types, we had the subjects choose between three topics:

- Describe your neighbourhood (description);
- Recount a funny incident that happened in your life (recount);
- Is Systemic Functional Linguistics useful? Give reasons (argument).

To encourage them to write approximately the correct number of words, a word-counter was included on the page to display the current number of words in their text. However, we left it to the subject to decide how many words their

[2] Available from <http://www.scriptlog.net>.

Table 12.1. *Special keys in the key-log data*

Sequence	Meaning	Example
\b	Backspace	the cot\b\bat
\f	Forward delete	The cot\m5\e\f\f
\m	Move cursor (characters from start of text)	\m123\e
\p	Paste	\pCHARS\e
\c	Cut (no. of chars)	\c4\e
\P	Pause (milliseconds)	\P1234\e

final text actually included. Permission to use the data for research purposes was also solicited on the Web page.

Once the page was set up, an email was sent to two linguistics lists with together around 1,000 subscribers (Sysfling and Sys-func). Data was collected from twenty subjects, consisting of fifteen descriptions, four arguments and one recount. Obviously the default nature of 'description' (first on the list) favoured this topic, and in future experiments, the order of topics would be randomised for each subject.

12.2.2 Format of the data

The form of the data collected looked something like the following:

\P671\eWe live \P2438\e\b\b\b\b\b\b\b\P563\eMyself \P766\eand the t\P781\ehree other students I \P1047\elive\P23047\e with\P1312\e share a house in\P1000\e \P594 \ethe Cathays area of Cardiff.\P1218\e Cathays is\P844\e probably the main\m183\ e\P3313\e\c2\ehouses\m204\e\P3781\e\c3\eajority of \P4813\ethe student \P829\ epopulation of Cardiff Un\P672\eiversity studwen\P547\e\b\bents.\m175\e\P20219 \eThe \m187\e\P1735\earea \P10563\e\c6\e\m193\eaccounts \P610\efor \m285\e\P6563 \e \P2547\e

where each normal character is shown as typed, and other key-presses and actions are represented as shown in Table 12.1.

The static representation shown above of the process of text production corresponds to the following text product:

Myself and the three other students I live with share a house in the Cathays area of Cardiff. The Cathays area accounts for probably the majority of the student population of Cardiff University students.

Pauses were only collected when longer than 0.5 seconds. Pauses shorter than this were not considered significant for the task of investigating discourse

structure, although others use far smaller pause information to good effect in exploring phenomena such as typing errors, etc.

12.2.3 Viewing the data

Because the key-logs are largely unintelligible to the human eye, I wrote software to display the text at each point through the creation of the text. One can step through a text either character by character, or, for rapid progress, skip through sequences of normal typing (including backspaces), only stopping where a mouse-movement or cut/paste operation took place. This software allowed me to view the general pattern of text production, results of which will be reported in Section 12.3.

12.3 Styles of writing process

The aim of following sections is to look at how writers revise their text, to see whether those revisions provide evidence for or against the claim that particular discourse structures (rhetorical structure, method of development, generic structure) could be instrumental in the writing process.

Before that, however, I want to explore this small corpus of writings to see to what degree writers do revise their text, as opposed to just writing the text from beginning to end without a backward glance. And if they do revise, are there patterns in their manner of revision?

Note that some research shows that writing styles differ depending on the writing task. Matsuhashi (1982), for instance, demonstrates that writers write differently when reporting than when generalising, following more of a schema in the former case.

First, I will define two terms: *minor revision* (correcting typos and spelling errors, and minor rephrasings without adding new content) and *major revision* (where the writer inserts new content, or deletes/moves chunks of content).

An intensive following through of the typing of each of the texts revealed four main types of writers, at least for this writing context:

1. *The one-pass writer:* This kind of writer just types their text from beginning to end without any backward revision, except for backspacing to correct typos and spelling errors in the word just typed. I note that this could be a product of the context of writing, and that these writers may in other contexts perform more revision.
2. *The cyclic local reviser:* This kind of writer writes a sentence, then looks back at it, revises any errors, and then adds another sentence at the end of the text, revises it, etc.
3. *The two-pass writer:* This type of writer writes the entire text from start to finish (perhaps with cyclic local revision) and then returns to look over the

text from the beginning, fixing errors, or adding in text to make meanings clearer.

4. *The cyclic global reviser:* This kind of writer writes some text, then revises the entire text again, then adds some more text at the end. This kind of writer is more likely to make major revisions in the text than the local reviser.

Of the fifteen descriptive texts:

- The most common pattern (seven out of fifteen texts) was the two-pass model, usually a first draft with cyclic local revision, and a final global revision of the whole text, sometimes with just minor changes, sometimes inserting explanatory or additional material.
- Another two writers used the cyclic local revision model, however without a final global revision.
- Three of the writers wrote the entire text as if using a teletype (no use of mouse movement, just typing from beginning to end with some use of backspacing).
- The remaining three writers roughly fit the cyclic global reviser model, performing major revisions and deletions to the text as it developed, inserting whole sentences within the body of the text, etc.

Of the four argument texts, two followed the cyclic local minor revision pattern, with one of these ending with a global minor revision. The other two exhibited a more complex writing process, with lots of major revision (cut/paste, insertions, deletions, etc.). It seems that argumentative texts call for more of this type of revision, as logical arguments do not flow from the writer as fluently as descriptions do.

The final text was the sole anecdote, and it was constructed through a lot of major revision, intermixing local and global revising.

In summary, it is clear that, for at least these twenty texts, and this context of writing, the most common pattern is to develop the text forward, with local revision of each sentence. More often than not, the writer would finish with a final global revision of the text as a whole.

In Section 12.4, we will explore three separate models of text structuring, and look at how the evidence introduced above supports each of the approaches.

12.4 Ways of organising writing

One goal of this chapter is to gain some understanding into how people actually do write: what choices they make in the process of forming a text, and if these choices can be seen as part of a larger text organising process. James Britton and colleagues (Britton *et al*., 1975:39) once said:

It is tempting to think of writing as a process of making linguistic choices from one's repertoire of syntactic structures and lexical items. This would suggest that there is a meaning, or something to be expressed, in the writer's mind, and that he proceeds to choose, from the words and structures he has at his disposal, the ones that best match his meaning. But is that really how it happens?

While we do make lexical and syntactic choices in writing, I am more interested in the choices that structure the discourse as a whole, decisions as to what to include in the text, and how to organise it into a message.

In addition to Britton *et al*. (1975), several researchers working in the Process Writing school have addressed this issue, e.g. Flower and Hayes (1981) and Matsuhashi (1982). Matsuhashi complains that other approaches propose models of how we write, but do not test these models empirically, against actual cases of writing.

Here, I want to do exactly that, testing three of the main explanations of discourse structure from within SFL to see which seems to fit the examples within our dynamic corpus. These approaches are:

- *Generic Structure Potential* (GSP; Hasan, 1978; Martin, 1992), which describes the structure of texts in terms of constituency, proposing stages of the text, with elements either obligatory or optional, and usually imposing order on the stages. This work was based on earlier work by T. F. Mitchell (1957) on auctions in Cyrenaica, and Labov and Waletzky's (1967) work on oral narrative structure.
- *Rhetorical Structure Theory* (RST; Mann & Thompson, 1988; Mann *et al*., 1992), which explains text structure mainly in terms of dependency relations between segments, such as circumstance, evidence, purpose, etc. This approach has a relation to (and is partially derived from) work by Martin on conjunctive relations (e.g. Martin, 1992), although it also draws upon other theories of discourse.
- *Thematic Progression* (Daneš, 1974), and the related *Method of Development* (Fries, 1995), explore how a text unfolds in terms of a sequence of thematic entities, where each new sentence either continues with a previous Theme, digresses to an entity introduced in the previous Rheme, or uses a new Theme derived from a previously mentioned entity (e.g. 'Jenny' → 'her car').

Remember that, for this text production context, the cyclic local reviser was by far the most common strategy for text production, without major revision (just fixing expression problems), and possibly with a final global revision. Given this result, to best fit the data, the model of text production needs to address the point that these texts were largely produced from beginning to end without moving text around, and with few insertions of new content. Ignoring minor revisions, most of these texts were written linearly, from beginning to end. This might be because the writers produced the texts opportunistically, in a flow of consciousness manner, each point flowing from the previous. Alternatively,

there may be some degree of pre-planning, either unconsciously in their heads, or possibly externally on a piece of paper. Unfortunately, we do not have evidence either way. A future study would benefit by asking such questions of the writer immediately after they submitted their texts. Alternatively, some studies request writers to verbalise what they are doing and record this for later study.

We do not have space here to explore all twenty texts in terms of how well these discourse models appear to fit the actual process of production. Consequently, we will look in depth at only one of these texts. Since the most common model of production was the cyclic local reviser, I chose one of these at random, which will be analysed in terms of each of our structures below.

12.4.1 Generic Structure Potential (GSP)

In discussions of GSP, written and spoken discourse is taken to be functionally structured, in that the discourse is composed of a number of stages, each serving a distinct function (or functions) towards the purpose of the discourse as a whole. A discourse is not an unordered succession of facts, but is rather a structured whole, in which all information comes at a certain functional stage. A typical example is the functional structure proposed by Labov and Waletzky (1967) for fairy tales, which usually conform to a functional structure similar to:

Orientation ^ Complication ^ (Evaluation) ^ Resolution ^ (Coda)

Systemic linguists use the term 'Generic Structure' (GS) to describe those functional structures of texts which re-occur often in the society. The same structure can be re-used by different individuals, the GS representing a socially shared way of getting a task done. This structure adds to the meaning of the text, in that the way we interpret text depends on what stage of the text it is in (what function it is serving).

Different writing tasks may be more or less generically structured. Church services, for instance, tend to be highly structured, with fixed staging, although these stages may vary in how they are realised (e.g. the sermon component will change day by day). People depend on this structure to let them know what is going on, and what is expected from them at each step.

Other forms of discourse are less generically structured. The description genre, for instance, has so many possible structurings that it is difficult to talk about generic structure. In each description, the writer chooses a particular strategy to organise what they have to say. However, even within the multitude of different approaches, there are some common strategies for describing people, things or places.

Enkvist (1987) talks about various strategies for organising texts, including temporal sequence (most used in narratives, but also applicable for guidebooks), spatial organisation (e.g. describing the centre of a city then more distant parts), agent-dominated (texts that expand on a single person), etc. Enkvist proposes that most texts use a mixture of such strategies, for instance, a guidebook may be predominantly spatially organised (separated into cities, for instance), but within an entry, other organising strategies might be used, e.g. describing one location in terms of a temporally organised walk around the area.

Looked at in this way, we might describe a genre not in terms of a single generic structure, but rather as a set of distinct structuring strategies which the genre tends to make use of. This may be the best way to deal with neighbourhood descriptions, and descriptive texts in general, in terms of the set of organising strategies that writers typically draw upon.

O'Donnell (2000) looked at descriptions of museum objects in this light, outlining a number of different discourse strategies used in object description. While the basic structure of these texts is a sequence of facts on different aspects of the object (class, physical description, use, history, etc.), a number of secondary strategies are used, such as digression (providing details on a secondary entity), generalisation (providing details on the class of items to which this one belongs) and comparison (contrasting this item to another one).

Analysing the selected text, we might see staging as shown in Figure 12.1. In terms of overall structure, the writer seems to have followed a three-part structure. He starts with an abstract, a brief statement of what he will talk about. He then continues with a physical description of the neighbourhood. He then finishes by evaluating the neighbourhood. Within the physical description, the text is spatially organised, first describing the greater area (Cathays), then the more immediate area, and then the street itself. He then moves on to describe close-by facilities.

The presence of what looks like an abstract does suggest some sort of global planning before the text was started. The key-log reveals this was the first bit of text typed, not added later. The text after this, describing who he lives with and where the house is, followed after a few minor pauses, but never for more than a second.

The writer then extended this description of the neighbourhood. After this description, there was a major pause (10 seconds), suggesting the writer was putting some thought into how to continue (or end) the text, and this was followed by his evaluation of the neighbourhood. It is also possible the writer had a quick look at his email at this point, or something similar, but the fact that the pause occurs at a juncture where description changes to evaluation is suggestive.

To summarise the above, a quick look at our small corpus of descriptions suggests that this text type cannot be described by a single (or small group of)

Abstract	My university term time accommodation is a shared postgraduate student house.
Description	Myself and the three other students I live with share a house in the Cathays area of Cardiff. The Cathays area accounts for probably the majority of the student population of Cardiff University students. Our house is on the boundary of the Cathays - Roath area. As a result, though the majority of neighbouring houses are student houses like ours, there are also a few families and non-student people who live in our area. Our house is located on a road called Tewkesbury Place which is like a cul -de-sac ending of a longer road: Tewkesbury Street. The road is quite short (maybe twenty houses long on each side) and, as a result is a fairly quiet street; particularly for a student area! This also makes the parking access quite good, which is important as three of us in the house I live in own cars. We are in close proximity to Crwys Road which has a good selection of shops, restaurants and take-aways, which is handy. In the other direction, just a minute or two's walk from our house is Roath Park, one part of which is the part that houses Roath Lake. Having a green space like this close to our house is a plus. It gives you a place to walk around in relative peace and with nice surroundings, pretty much right on your doorstep. Myself and friends also make use of the Rec. - another part of Roath Park - to play football on.
Evaluation	For student living, I think our house, the area it is in and the surrounding neighbourhood is pretty good and we are thus fairly fortunate. We have the plus of being close to university, with good amenities around us, and some green space. Our neighbours aren't that loud, though we do have quite a few students around us. And the streets and pavements are fairly clean and tidy (refuse collection is good in Cardiff). I have lived in other areas of Cardiff in the past and not liked the location of those houses as much as I do the current house I live in.

Figure 12.1. Staging in the descriptive text

generic structures, and thus we turn to Enkvist's expanded notion of text structure, whereby a genre is defined in terms of the set of text formation strategies that it typically makes use of, although no text in the genre is constrained to draw upon any particular strategy.

Looking at this one text in particular, it does seem that the writer is writing in terms of staging: an initial abstract, a description stage, and finally an evaluative stage to finish off. The fact that he produced clauses serving a similar function (description, evaluation) in clumps supports the plausibility of generic staging as a real organising factor in the production of this text.

Looking at other descriptions in the corpus reveals a wide range of strategies used. Some are temporally organised (one explains how the neighbourhood grew, another describes what it was like when he lived there, vs. what it is like

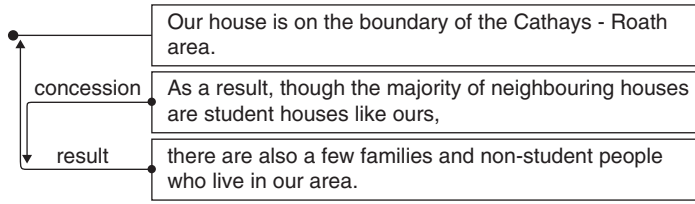


Figure 12.2. Segments in nuclear–satellite relations

now). Another starts off anecdotally, detailing how the writer and his family came to live there, but ends with a true description. Most have a core description stage (describing streets, parks, etc.), but most have other stages as well.

A fuller study would analyse the remaining descriptions in our corpus in more depth (and indeed a wider selection of descriptions) to see whether staged production of meanings is typical, and if so, what recurring pool of organising strategies are being drawn upon by different writers to organise their texts.

12.4.2 Rhetorical Structure as a Dynamic Process

Rhetorical Structure Theory (RST; Mann and Thompson, 1988; Mann *et al.*, 1992) is a theory of how segments of text (sentences for the most part) fit together. While not intended to offer a theory of the process of text composition, it has been used as part of such theories, most particularly in computational work in discourse generation (e.g. Grote *et al.*, 1997; O'Donnell *et al.*, 2001).

RST posits three structures for fitting text together:

1. *Mononuclear (dependency) relations:* one segment of text (a *satellite*) is linked to another (the *nucleus*) by a named dependency relation, e.g. Figure 12.2 shows three segments. The first segment has one dependent, the third segment, which is a Result. This segment also has one dependent, which is a Concession. The general claim is that satellites (and their dependents) can be deleted from a text without disrupting the overall text structure (although repair of cohesive items might be required).
2. *Multinuclear relations:* basically represent different kinds of lists, where each segment has the same status as the others. Typical relations are Conjunction, Disjunction, Sequence, etc. (see Figure 12.3 for an example).
3. *Schemas:* a schema is basically a sequence of segments, where each segment bears a distinct function in the whole. This basically covers the kind of structures covered by GSP, so we might have a schema for an academic article: Introduction ^ Body ^ Conclusions (see Figure 12.4 for an example).

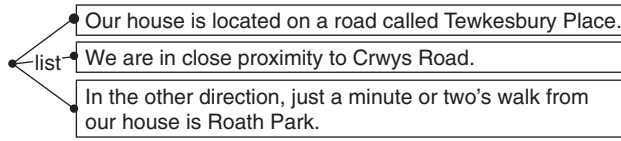


Figure 12.3. Segments in a multinuclear 'list' relation

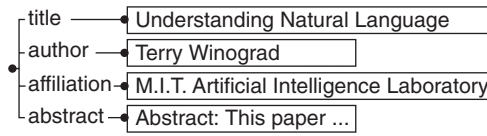


Figure 12.4. Segments in an 'Academic Article' schema

Figure 12.5 shows our neighbourhood description analysed in terms of RST. While the individual relational connections and labels might be argued over, the overall structure is a viable one.

Note that since RST schemas correspond roughly to GSP, the top level of the RST tree is identical to the analysis given in the GSP section above. RST has the advantage over GSP in that it can handle issues of global text structure through schemas, but can also describe the composition of each stage in terms of either a list-like structure (e.g. a sequence of points in an argument), in terms of a central nuclear fact and its satellite segments, or, if needed, in terms of an embedded schema.

Returning to our corpus, remember that most of the texts were produced from start to finish with few backward additions of content. If RST was taken as an organising structure of our writing process, then satellites appearing before the nucleus on which it depends are somewhat problematic, since this assumes the writer is thinking several steps ahead (our writers are not typing the nucleus, and then going back to type the dependent satellite: in cases where the satellite precedes the nucleus in the finished product, it is typed before the nucleus).

Given the higher cognitive load required to place satellites before a nucleus, we should expect that, if text is produced linearly, most satellites will occur after the nucleus. Looking at the RST analysis in Figure 12.5, this is the case: of sixteen satellites, only one precedes its nucleus. This case is as follows, a Concession relation:

SATELLITE: though the majority of neighbouring houses are student houses like ours,
NUCLEUS: there are also a few families and non-student people who live in our area.

This pattern is not unique to this text. Indeed, some who work with RST have noted that satellites following the nucleus are the norm (e.g. Marcu, 2000).

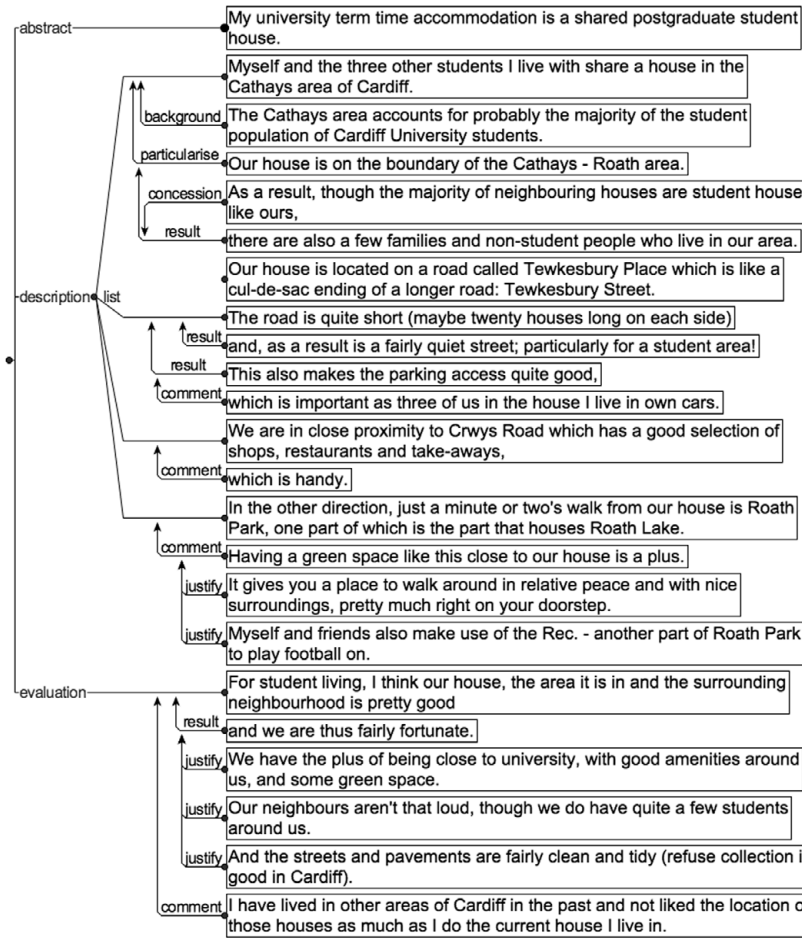


Figure 12.5. RST analysis of a neighbourhood description

RST-trees thus tend to be right-branching rather than left-branching. The right-branching nature of RST makes it more likely that it has some correspondence to what the writers in our corpus are actually doing.

The one place where this author modified the RST structure of the text through a later revision is shown below. Before the revision, the author had a single justification of why a green space was a plus. The revision offered an additional justification of its value (see Figure 12.6(a) and (b)).

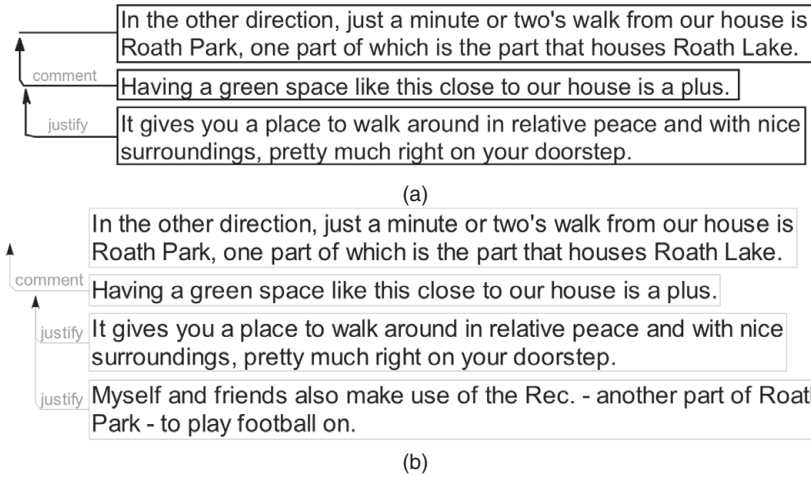


Figure 12.6. Text before (a) and after (b) revision

12.4.3 Thematic progression as a dynamic process

Thematic Progression, as introduced by Daneš (1974), proposes three main sources of the Theme of a sentence:

1. It can repeat the Theme of the previous sentence (constant Theme);
2. It can be an element mentioned in the previous Rheme (linear Theme);
3. It can develop another derived aspect of an implicit or explicit Hypertheme being developed by earlier Themes (e.g. if we introduce the three stages of life, then later Themes may be 'childhood', 'adulthood' and 'old age').

Other sources for Theme have also been proposed. Additionally, the source of the next Theme may be drawn from a sentence somewhere before the immediately prior one.

It is also important to note that the Theme in some cases is itself new information, as is usually the case with the Theme of the first sentence, although often a contextually salient entity will be used as the first Theme (e.g. starting a text with 'I' or 'We', etc.).

I do not want to spend space discussing how to identify Theme, but I note that Halliday's description of Theme is the most frequently used (e.g. Halliday & Matthiessen, 2004). See Kappagoda (this volume) for a lengthy discussion of Theme in Halliday's model, and how the writer's discourse goals can drive the general pattern of Theme selection, although he does not address my current goal, which is to explain how a text comes to be structured as it is.

In any case, I have found a variant of Halliday's approach, proposed by Margaret Berry (see Berry, 1995) to be more useful. The main distinction

between the approaches is as follows. Halliday will take as Theme the first occurring element of the clause expressing experiential content, and while this is in the unmarked case the Subject, in marked cases it may be an Adjunct (or Complement, etc.). Berry, on the other hand, distinguishes between the 'Basic Theme', which will in general be the Subject, and 'Additional Themes', which accounts for all fronted Adjuncts (barring textual ones) and Complements.

In my own analysis of texts, I have found that analysing in Berry's terms provides clearer patterns, that most typically the Adjuncts reflect a different pattern than that in the chain of Subjects. For instance, in one history text reporting on the life of Columbus, fronted Adjuncts mark change of time period, while the Subject chain represents Columbus and family. This pattern is obscured when the Theme is taken as whatever happens to come first of the Subject and experiential Adjuncts. Table 12.2 shows our text analysed in Berry's manner.

The arrows in the third column are used to indicate where the Theme is coming from (borrowed in part from a presentation by Keizo Nanri; see Table 12.3 for their meaning).

For a description of a neighbourhood, I would have expected that most of the Themes would be the house, the street and nearby facilities, etc. For this text, this is true to an extent. However, people (the residents of the house, friends and neighbours) occupy a large number of the thematic slots. Other Themes are more complex, for instance the existential *there* in the fifth line, and the non-finite clause in the twelfth line of Table 12.2.

If thematic development was to be taken as the organising principle of text development, then texts would appear very much as flow of consciousness, with each sentence developing one of the entities recently mentioned in the text, with the next sentence continuing this theme or perhaps taking up one of the newly introduced entities.

While texts could be developed in this manner (and indeed some 'flow of consciousness' texts certainly seem to be), then one would not expect a large degree of global structuring, which does seem to be more evident in the texts of this corpus. It is possible, however, that GSP may account for global structuring and, within each stage, writers develop the Theme opportunistically within stages. Our key-log data does not offer evidence for or against this proposal.

One possible item of evidence against this proposal is the fact that Theme selection does not necessarily constrain the content that goes into a text. Teachers of SFL often get their students to take a short text and change the thematic selections throughout the text. This can be done to improve or worsen the text, but the underlying organisation of the content in the text stays the same. For instance, compare Table 12.4(a) (the original) and Table 12.4(b) (revised to focus on products rather than people).

Table 12.2. *Analysis of thematic progression following Berry's approach*

Conj.	Additional Theme		Basic Theme	Rheme
			My university term time accommodation	is a shared postgraduate student house.
			Myself and the three other students . . .	share a house in the Cathays area of Cardiff.
		⇖	The Cathays area	accounts for probably the majority of the student population of Cardiff University students.
As a result,	though the majority of . . . houses are student houses	⇘	Our house	is on the boundary of the Cathays - Roath area.
			There	are also a few families and non-student people who live in our area.
		⇘	Our house	is located on a road called Tewkesbury Place which is like a cul-de-sac ending of a longer road: Tewkesbury Street.
		⇙	The road	is quite short (maybe twenty houses long on each side)
and, as a result		⇓	(the road)	is a fairly quiet street; particularly for a student area!
		⇙	This	also makes the parking access quite good, which is important as three of us in the house I live in own cars.
		⇘	We	are in close proximity to Crwys Road . . .
	In the other direction,	⇙	just a minute or two's walk from our house	is Roath Park, one part of which is the part that houses Roath Lake.
		⇙	Having a green space . . . close to our house	is a plus.
			It	gives you a place to walk around in relative peace . . .
		⇘	Myself and friends	also make use of the Rec. - another part of Roath Park - to play football on.
	For student living,	⇓	I	think our house . . . and . . . neighbourhood is pretty good
and		⇓	We	are thus fairly fortunate.
		⇓	We	have the plus of being close to university, . . .
		⇙	Our neighbours	aren't that loud,
though		⇘	We	do have quite a few students around us.
And		⇙	the streets and pavements	are fairly clean and tidy
(		⇙	refuse collection	is good in Cardiff).
		⇘	I	have lived in other areas of Cardiff in the past
and		⇓	(I)	not liked the location of those houses as much as I do the current . . .

Table 12.3. *Meaning of the arrows marking thematic progression*

⇩	Constant Theme	Repeats the Theme from the previous sentence.
⇗	Linear Theme (Digression)	The Theme occurred in the previous Rheme.
⇘	Theme Return	A previous Theme is restored after a digression, or after a derived Theme.
⇙	Derived Theme	The new Theme is a related aspect of the previous Theme (or Rheme) ('She' → 'Her mother').

Table 12.4(a). *Corporate-focused advertisement*

	Make	Our Tourist Information Centre your first call.
	Our friendly team	provide an extensive range of services . . .
	We	Can book accommodation . . .
	We	supply tickets for local events . . .
In summer,	we	organise a varied programme of Scenic Coach Tours of the Cotswalds
	We	stock a wide range of maps, walking trails . . .
	We	Can help you with advice on . . .

Table 12.4(b). *Product-focused advertisement*

Make	our Tourist Information Centre your first call.
An extensive range of services	is provided by our friendly team . . .
Accommodation	can be booked for you . . .
Tickets for local events	are available . . .
A varied programme of Scenic Coach Tours of the Cotswalds	can be booked during summer.
A wide range of maps, walking trails, etc.	are available in the office
If you need advice on . . .	we can help

In the second version of the text, the thematic progression has been totally changed, yet the overall organisation of information stays the same. This argues that while thematic progression can make a text more or less coherent or effective, it may not be a good candidate as the driving force in the text composition process.

12.5 Conclusions

In this chapter I have argued that to properly understand 'choice' in writing, one needs to move away from a product orientation to text description, towards a process orientation. We do not 'choose' finished texts. Rather, the text is the

result of a series of choices we make during the process of writing, and these choices can range over the already written text, overwriting whatever choices we made previously.

Choices in writing are made at many linguistic levels, ranging from choices in how we organise the discourse as a whole down to how we spell a word, or where we place punctuation. We choose what meanings to express, how to express them syntactically, and which words to use.

My focus has been on higher-level choices: those choices we make in writing that lead to content being organised as it is into the finished text. I explored three of the main discourse structure descriptions used by SFL, and tried to see which of these seems to be most plausible as a resource used when writing descriptive texts, given the evidence of the key-log corpus, with particular focus on one of these texts.

GSP is best suited to genres which are more strongly generically structured, and description texts are not so generically structured. By moving towards Enkvist's approach, with texts structured in terms of alternative text organising strategies, and allowing for multiple interacting strategies in a single text, then the extended approach proves adequate to explain these texts, at least at the higher level of structure. It would be difficult to explain the structure of entire texts in terms of generic staging, however.

RST, as extended to include schemas and multinuclear structures, seems adequate to explain the production process of these texts, particularly if a right-branching bias in RST structure is assumed, which means that the satellites that elaborate on a nucleus come after the nucleus, requiring less forward planning.

Thematic Progression, while it can be applied to any text, does not seem a likely candidate to explain how we go about writing a text. The fact that the thematic chains in a text can be substituted for totally different chains without destroying the text's overall organisation supports this conclusion.

This chapter has attempted to assess the plausibility of these three approaches to text structure as primary areas of choice in the organisation of our writing. However, the evidence gained is just suggestive, and a full understanding of how we produce text remains generally open, a fruitful area for future research.

12.6 Implications for language teaching

When we are teaching students how to write, showing them finished products is just part of the picture. I believe spending more time on how to develop a text from start to finish is more rewarding.

Part of the process of writing certainly should involve a pre-planning stage, getting the students to organise the main stages they wish to include in their text. Here, teaching common generic structures for the text types they are learning would be useful (even though it is product-oriented). However, as I tried

to show above, there is a wide range of variation possible in generic structure, both in terms of the global organisation, and also in terms of combining different organisational strategies within the same text (e.g. Enkvist's example of a spatially organised guidebook, with some sections realised in terms of a temporally organised walk around a city). Following such a strategic approach to generic structuring, teaching should emphasise the basic components of generic structure (different ways of describing, of arguing, of giving instructions, etc.), as well as how these elements can combine within a full text.

More importantly from a strategic perspective, the teaching of strategic use of RST (or conjunctive relations if one prefers a Martin approach) would be of value. Here, rather than analysing what is good in a finished text, the students could be presented with unfinished texts, and the class would then explore the different ways in which the text could be improved. Where some statement is unclear, the insertion of examples, definitions, background, etc. would be motivated. Where a claim appears unfounded, the different ways of inserting evidence may be demonstrated. Hopefully, through this approach the students will come to understand the steps they can take in their own writing to develop their own text from scratch.

While not a driving force in the creation of a text, thematic progression can be effectively taught so as to enable students to produce more effective texts via appropriate selection of Themes for each sentence. Alonso Belmonte and McCabe (2003), for instance, propose that making students rewrite their texts with different thematic patternings can help them understand how to improve their writing.

Part IV

Cultural and Contextual Constraints on Choice

13 Choice, system, realisation: describing language as meaning potential

Ruqaiya Hasan

> . . . in linguistics language is turned back upon itself. We have to use language about language, words about words, letters about letters.
>
> (Firth, 1957:121)

13.1 Introduction

'Choice' is a 'common word' borrowed to function as a technical term in Halliday's Systemic Functional Linguistics (SFL).[1] However, the continued use of common words in the realm of theory alters their semantic identity: they put away things non-theoretical, and their meanings are largely governed by the co-ordinates of the theory, with the word's value and signification becoming equally virtual. The 'things and relations' they refer to represent 'constructs' that 'have no ontological status . . . They are neither immanent nor transcendent but just language turned back on itself' (Firth, 1957:181; also Halliday, 1984a). Ideally then, technical terms should perform some precise functions demonstrably essential to the theory's working: in fact, their validity can be judged only by the work they do in construing a model of language (Halliday, 2002d; Butt, 2005; Butt & Wegener, 2007).

But the reverse is just as true: a theoretical term is only as valid as the 'ideas about language' modelled by the theory (Halliday, 1976a, 1977a): I have argued (Hasan, 2012, 2013) that the SFL modelling of language has reached considerable success, which is not to claim that the *theoretical* profile of language has become simpler; simply that the processes of the system as identified by the theory agree with the users' experience of it as a MEANING POTENTIAL: a successful theory must allow the renewal of connection with the data of experience current in the community.

[1] 'SFL' refers here to my interpretation of the systemic functional linguistic theory associated with Halliday's name. There is no assumption that Halliday or colleagues will necessarily be in agreement.

These remarks suggest that the exploration of theoretical terms such as, say, 'choice' in SFL or 'string' in String Theory ranges over a wide area of concerns. It is one thing to say how a term is used in a theory and quite another to judge whether as a technical term it functions efficiently, or whether the theory's conceptualisation of language is competent. Clearly some serious topics of research await attention in a serious exploration of choice. But for lack of space and time, like others I too will regrettably skirt most of them. The present chapter will be concerned with one claim, namely that *choice in SFL is theoretically motivated as a fine-tuned activator of the systemic paths and their realisation, which together represent language as meaning potential, a property that inheres in SFL's conception of language as a 'social semiotic'* (Halliday, 1978b).

13.2 Is language a social semiotic?

How would one justify the conceptualisation of language as a social semiotic? Why attach such fundamental importance to it? There is a general problem in answering these questions: given that theories of language are usually partial to the theorist's concept of language, what *reasonable* grounds can be suggested for judging this concept valid? Linguists have often been preoccupied with the defining properties of a 'good' theory, but they have seldom questioned if what a linguistic theory is describing can be taken as a valid conceptualisation of 'language', leave aside identifying bases for judging the validity of the response. Meanwhile different conceptions of language have always been around, and often they have excited what Peirce (1955) would call a 'doxic belief'. It is reasonable to ask: Which conceptions should be accepted and why? Are they mutually incompatible? If not, what does this imply about the nature of linguistics as a science of language? Such questions spell the REAL issues for determining the value and signification of the expression 'linguistic theory', and without viable answers claims about the 'true' nature of language will remain a gleam in the theorist's eye.

13.2.1 Language as a 'pure' semiotic

Faced with this dilemma, I turn to an exceptional scholar, Ferdinand de Saussure, who did offer some justifications for *his* conception of the object of enquiry for linguistics by naming a single inherent property of language and deriving most of his categories of language description as a set of corollaries arrived at logically by probing that axiomatic property. According to Saussure (2006:21) 'language is a system of signs that express ideas', and linguistics, the science that studies it, 'is only a branch of the science of semiology' (Saussure, 1959:16). The robustness of this property of language is universally affirmed in

human experiences of the exchange of meaning, while the sign's function in the exchange of meaning points to it is as the basic unit of language. Saussure has left an outline of a theory based on those properties of the sign that enable the sign system of language to work as it does in the daily exchanges of meaning.

This approach is a reason for interest in his conceptualisation of language, but there is another, more relevant reason for mentioning the topic here. I have argued (Hasan, 2013) that Saussure provides a remarkably impressive basis for an explicit and coherent description of *langue* as a sign system, i.e. as a *SEMIOTIC*; but his linguistics of *LANGUE* is unable to achieve its aims precisely because it attempts to describe language simply by reference to just one aspect of a semiotic, namely its SYSTEMICITY which characterises *langue*, ignoring the PROCESS of semiosis, i.e. *PAROLE*. I say this not because *parole* is important as the only evidence for *langue*, the system, but much more primarily because the research project he outlines just cannot be carried out without investigating the regularities in *parole*. Saussure's descriptive categories are derived exclusively from the sign and the sign's regular, systematic relations. Nothing would be admitted into his linguistics that is not derivable from *langue*, or not guided by TEMPLATES, i.e. regular underlying patterns whose instances were subjected to unprincipled variation in the syntagms of *parole* on which the study of syntax is based. The reason he excluded *parole* from the linguistics of *langue*: *parole* is not subject to systemisation; it displays no regularities. He certainly would not have accepted the existence of any 'morphology of folklore'. This creates a paradox whereby the sign becomes a 'sign in itself' independent of the users' sense of its value and signification, and yet by necessity, the value must depend on the relations revealed by regularities in *parole*.

13.2.2 Language as a social semiotic

As a post-Saussurean linguistic theory, SFL adopts Saussure's postulates about the linguistic sign, but in developing the logical implications that follow from probing that characterisation, it rejects Saussure's exclusion of *parole* as external to a linguistics whose declared aim it is to offer a *full* logical description of the sign and its value (Hasan, 2013). There are three reasons for this: (i) SFL offers proof that *parole* is systemisable, citing conditions that presuppose regularities; (ii) without the inclusion of *parole*, the Saussurean linguistic theory is bound to fail: in excluding *parole* it will lose all evidence of the 'MORPHOLOGY of meaning' or 'the interplay of signs called langue' (Saussure, 2006:21); there will be no ground for suggesting that the value of a sign resides in its relation to other signs; and finally (iii) Saussure's theory as it stands is riven with paradoxes; SFL demonstrates that the paradoxes and lacunae are created by the exclusion of *parole*; they disappear when the semiotic process is theorised as internal to the structuring of language as a semiotic system. Saussure (2006)

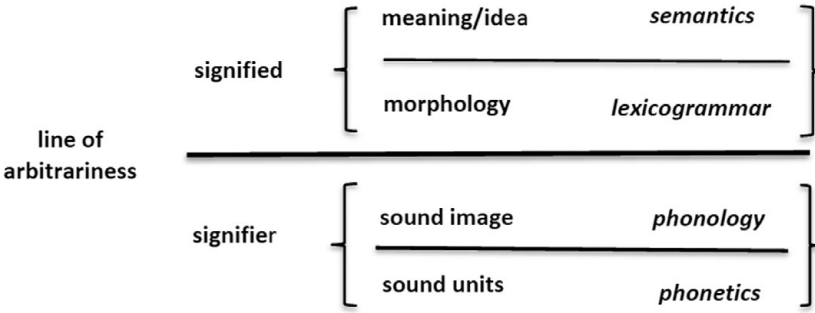
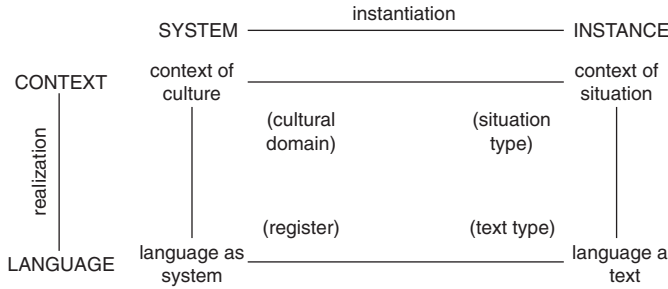


Figure 13.1. The inner stratification of language: Saussure and SFL

maintains that a sign is known by its meaning, the scientific description of which is the primary aim of the linguistics of *langue*. What he does provide in his seminal writings (1966, 2006) is an incomplete, albeit brilliant, account of language as a purely semiotic system: what SFL has done is to develop it with a potentially exhaustive and explanatory theory of language as a social semiotic. I am not claiming that SFL consciously undertook this as a mission: the simple fact is that it began with language as a communicative system operative in social life and it pursued those ideas about language by following the same kind of inferential logic as Saussure had used some decades ago. SFL had developed an extensive technical vocabulary which was shaped by a theory which is remarkably congruent with the Saussurean directions except for one outstanding difference: SFL rejected Saussure's exclusion of *parole*, and in so doing it resolved most of the Saussurean paradoxes (Hasan, 2013). For lack of space, I simply enumerate the major features of the theory which enabled SFL to achieve this accomplishment:

- SFL theorising Saussure's views on the 'essential duality' of sign as evident in the arbitrary relation of signified and signifier; although Saussure's distinction between sign-meaning and the sign's morphology as well as the distinction between sound image and sound units was not so obvious until recently (2006), SFL had theorised these relations as the STRATIFICATION of the sign system of language as SEMANTICS (= Saussure's sign-meaning), LEXICOGRAMMAR (= morphology of meaning), PHONOLOGY (= sound image) and PHONETICS (= sound units). The unity of the stratified system experienced in *parole* as a single seamless stream is explained in SFL by the REALISATION relation (see the discussion of stratification and realisation in, e.g., Matthiessen, 2007; Halliday, 1992a, 2009; Hasan, 1995, 2013). Figure 13.1 presents the congruence between Saussure's and SFL's views of the inner structure of language.



Note: Culture instantiated in situation, as system instantiated in text.

Culture realized in/construed by language; same relation as that holding between linguistic strata (semantics: lexicogrammar: phonology: phonetics).

Cultural domain and register are 'sub-systems': likeness viewed from 'system' end.

Situation type and text type are 'instance types': likeness viewed from 'instance' end.

Figure 13.2. System and instance: language and culture, text and situation

- Theorising the relations of langue and parole: for SFL, *parole* is not simply a sequence of signs along the spatio-temporal axis; it also participates in social activities which occur in some context of situation; these situations instantiate the community's cultural context. SFL theorises the relation of *parole* to context of culture as well as to the system of language, demonstrating that the choice of linguistic signs is not random in *parole*: it correlates with the activity types; the cultural regularities in social practice are construed in language, which implies patterns of regularity in language use. These relations are displayed in Figure 13.2 (from Halliday, 1999; for some discussion, see Halliday, 1999, 2009; Matthiessen, 2007; Hasan, 2009b, 2012).
- Using categories of units as the focus of systemic description rather than instances: Saussure's associative relations (e.g. 1959:126, on *enseignement*) are replaced in SFL by a paradigmatic description in terms of systemically calibrated choices focusing not on items but on categories of stratal units. The realisation of these are TEMPLATES for Saussure; SFL, using terms such as SYSTEMIC PATHS, SELECTION EXPRESSIONS and REALISATION has refined this concept: the realisation of a systemic path is a template (i.e. STRUCTURE). Not all syntagms are syntactic: some may be derived from regular patterns of occurrences in *parole*, such as COHESIVE HARMONY (Hasan, 1984), GSP (Generic Structure Potential; Hasan, 1978, 1985c), PHASAL ANALYSIS (Gregory, 1985), RST (Rhetorical Structure Theory; Mann *et al*., 1992) and RHETORICAL UNIT (Cloran, 1994).

12.2.3 The reciprocities of the social and the semiotic

What makes SFL a *social* semiotic is its insistence on the reciprocal relations of language and society: language as a sign system enables meaning exchange in the performance of social practices, but it is the systemic aspects of culture that legitimise the choice of meanings that can be meant appropriately in the context of that social practice. The interplay of the social and the semiotic systems is equally important to the shaping of culture and to the meaning potential of language. Halliday (1970:141) has observed that "[t]he nature of language is closely related to the demands that we make on it, the functions it has to serve". Deriving his concept of METAFUNCTIONS from this observation, Halliday (1973:101) indicates its basis in register variation, i.e. in the common practice of 'Speaking with Reference to Context' (Hasan, 1999). The details of the specific meanings of signs are metafunctionally shaped at the strata of both semantics and lexicogrammar: there is no other way for the production of meaning by speaking except through what Saussure (2006) called 'the morphology of meaning', and this morphology presents itself only with signs in use: when *parole* is excluded from linguistics, as in Saussure, the theory loses not only this resource but also the important concept of linguistic variation. The reciprocal relations of language and culture inform not only register variation, but other forms of SYNCHRONIC LINGUISTIC VARIATION; and scholars (e.g. Labov, 1972) suggest synchronic variation as a precursor of DIACHRONIC CHANGE. SFL has cogent reasons for recognising the CONTEXT (of culture and situation) as a stratum in linguistic theory.

Figure 13.3 represents the SFL view of language as a social semiotic, where surrounding the four language-internal strata is a fifth and necessary stratum in the theory, called 'context of culture and situation', typically abbreviated as CONTEXT. This language-external stratum represents the theory's concept of social environment, essential for *parole* and for the creation, maintenance and development of language (for discussion, see e.g. Halliday, 2009; Hasan, 2009b, 2009c, 2010, 2012). If the sign system of language is essential to the exchange of meanings, then the exchange of meanings also needs a cultural other to exchange the meanings with: language and culture work on co-genetic logic. Cultures as we know them with all their benefits and constraints could not have come about without language; and language without human associations could not have evolved as it has. Saussure showed that the conjunction of the signified and signifier sets in motion each sign's dependence on other signs for its identity. Accepting that Saussurean insight, SFL has also taken seriously the fact that to remain alive and to develop, language systems must work in societies where each member's individuality is defined by that of the others: the systemic aspects of culture are engendered in accommodation, aggression and assistance. Language as an inventory of fixed patterns, be they sentences, syntactic patterns,

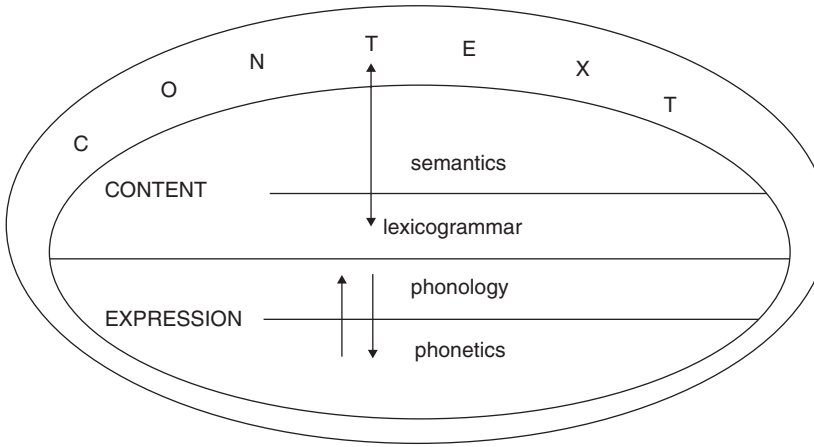


Figure 13.3. The sign system of language embedded in context of culture

words or morphemes, cannot cope with such a complex situation: as an adaptive signing system it must be an open-ended, ever-changing and accommodating potential for making meaning. It is this argument and its pursuit that make SFL a social semiotic. The theory must model this always changing, always stable system of signs: in CHOICE, SYSTEM and REALISATION, it has developed a method of description that represents language as a meaning potential (see Section 13.4 below). There is no claim that all avenues and aspects have been turned into actualities, simply that the theory opens the door to the study of all phenomena relevant to understanding language (Hasan, 2009b, 2013).

13.3 The semantics of stratification

Section 13.1 claimed that technical terms are accountable to the theory's modelling of language. In Sections 13.3.1 to 13.3.5, I draw attention to three concepts explicitly represented in Figure 13.3: (i) stratification; (ii) realisation; and (iii) context. I will also introduce the terms UNIT and SYSTEM, although Figure 13.3 does not show them: for reasons discussed above, these concepts are just as relevant to SFL's view of language as social semiotic as they are to the operation of 'choice' in the description of language as a resource for meaning in the living of life.

13.3.1 Stratification in language as a sign system

Each stratum in Figure 13.3 represents a distinct order of abstraction: the nature and function of patterns at each stratum is different, and requires separate descriptive categories. This is the basis of stratification, and as indicated (in Section 13.2.2) it was implicit in Saussure's concept of sign as an entity

made up of two logically unrelated parts, whose union is nevertheless essential to the recognition of the entity as a unit capable of signing. The *primary step in stratification* consists in theorising signified and signifier as stratified; it was taken *explicitly* not by Saussure but by Hjelmslev (1969), as CONTENT and EXPRESSION PLANES, respectively. Unknown to Hjelmslev, Saussure (2006) provides justifications for recognising a *secondary step* by abstractions within both signified and signifier, with each further divided into two (cf. Figure 13.2). These are approximately the same abstractions Hjelmslev recognised as CONTENT SUBSTANCE (= meaning) and CONTENT FORM (= morphology) on the content plane and as EXPRESSION FORM (sound image) and EXPRESSION SUBSTANCE (sound unit) on the expression plane. As is obvious from the European linguistic literature, the four inner strata of language (Figure 13.3) had been widely recognised, albeit by different names, by the time SFL first appeared on the scene (in 1961; see Halliday, 2002a). Today we can confidently claim that language is universally multistratal: there is no adult language with less than four strata.

Anyone interested in enquiring into the usefulness of theoretical terminology (sometimes called 'jargon') need only compare Saussure's vocabulary with that of Hjelmslev's or Halliday's, say, with reference to the term *signified*. Saussure (1959, 2006) would refer to the signified as 'meaning' or 'idea' or occasionally 'concept'. And he would use precisely the same set of words in referring to 'the meaning created by the interplay of signs' (*content substance* for Hjelmslev, and *semantics* for Halliday), as opposed to the 'interplay of signs that produces sign-meaning' (*content form*, for Hjelmslev, and *lexicogrammar* for Halliday). Clearly the words *meaning*, *idea* and *concept* do not mean the same thing in the two different environments. Saussure recognised the distinctions at each point, as do Hjelmslev and Halliday; but unlike the latter two he did not theorise them: to do that, he would have needed to seek the common denominators across these distinctions. For example, Halliday treats each stratum as distinct from the others but also points to something in common with them: each stratum represents a different kind of abstraction, which implies that the descriptive categories pertaining to one cannot be applied to those of the other(s); at the same time the strata are alike in that each of them is equally essential to achieving the total description of the language as a sign system, and the organisation at each stratum is both similar and different.

13.3.2 Strata and unit scale

One example of this latter quality is the concept of UNIT SCALE (known also as RANK SCALE). At every language-internal stratum there will be an array of units which vary in size from the biggest/highest to the smallest/lowest; the relation between them will be that of CONSTITUENCY. Just as the number of

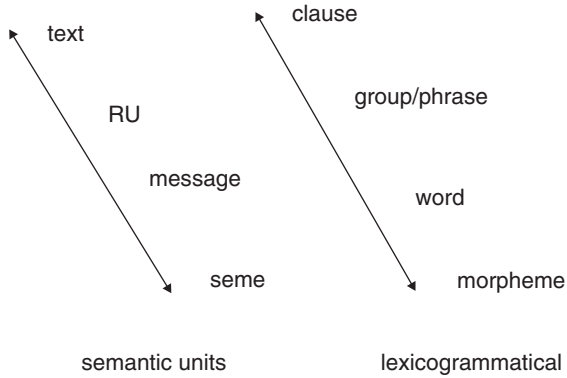


Figure 13.4. Unit scale at semantic and lexicogrammatical strata in English

strata across the languages of the world can vary so long as it is not less than four, so also the number of units at each stratum can vary so long as it is not less than two. Figure 13.4 presents the units on the rank scales of English semantics and lexicogrammar.

Each stratum presented here carries four units on its rank scales; the 'higher' unit in each case 'is made up of' one or more than one units 'next below'. Thus in Figure 13.4, at the semantic stratum the unit TEXT is made up of one (or more) RHETORICAL UNIT (= RU), each RU is made up of one (or more) '*message'* which is made up of one (or more) '*seme*'. Similarly, with lexicogrammar, the highest unit, CLAUSE, is made up of one GROUP/PHRASE (or more), a group/phrase is made up of one WORD (or more), which is made up of one MORPHEME (or more).

13.3.3 Realisation: the essential unity across distinct strata

Saussure argued that the duality in the unity of the linguistic sign was essential for its signing function: to act as sign, the sign-parts need to be both distinct and united as one.[2] The concept of stratification foregrounds the distinct nature of the two parts, while the unity of the strata is announced by the relation of REALISATION (Matthiessen, 2007; Halliday, 1992a, 2009; Hasan, 1995, 2009b, 2010; Butt, 2008b).

[2] In fact stratification is a condition of something being a sign: all signs 'point to content'; all content implies 'content expression'. Unlike some other signs (Hasan, in press) language is a system, and the system has multiple coding, typically displaying four strata.

The realisation relation re-presents the phenomena of one plane in a different guise on another. Simplifying somewhat, the signified is patently *not* the signifier, but it is presented to the senses as a signifier, a re-presentation of meaning as sound: in other words, *there is a realisation relation between the signifier and the signified*. Realisation is, thus, a relation that eventually bridges the distance between the intellig-ible and sens-ible faces of language. Acting bidirectionally in SFL, realisation enables the process of meaning exchange across the stratal hierarchy: from the speaker's perspective, a semantic construct is realised as a lexicogrammatical one realised as a phonological one realised as a phonetic one. From the perspective of the listener, the phonetic patterns realise the phonological ones realise the lexicogrammatical ones realise the semantic ones. The vertical arrows linking all the strata in Figure 13.3 represent this situation (further discussion in Section 13.3.4).

However, all analogies are imperfect: talking of realisation as translation/transmutation/re-presentation may suggest a one-to-one correspondence, as may happen sometimes in re-presentation between the original and its copy. But realisation is quite unlike re-presentation in this respect: the units of strata are never in a one-to-one relation *across the board*; instead, a substantial proportion are related by variable degrees of 'regularity of coupling'. For languages to work as they do in communal life, this regularity must be above the level of chance. But if the strength of probability turned into certainty across the board, the setting up of distinct strata would become an extravagance: every phenomenon on one stratum would become explicable by its counterpart on the other stratum. This led Hjelmslev (1969:112) to suggest that "the two planes must not be conformal". Had the strata been conformal, the term 'choice', if it were still applicable, would refer to qualitatively different relations.

Returning to the unit scale in Figure 13.4, the realisation of meaning as a lexicogrammatical category is not subject to a mechanical rule whereby meaning A always and only corresponds to wording A_1; it is quite common to find one-to-many and many-to-one correspondences. This does not imply 'anything goes' in language; a delicate and complex calibration of meaning and wording comes through probabilities of their occurrence in specifiable environments, which suggests that there are default couplings as well as conditioned ones (Hasan, 2011).

13.3.4 Context and the exchange of meaning

The context of culture and situation is equally relevant to the system and process of language as a signing system (see Figure 13.2). As Firth said, we never encounter language as system: what we do encounter as available to the senses is the system in use; insights into the nature of the system is provided by

its instantiation in *parole*; hence Hjelmslev's (1969) observation that process determines system. How does context come into this determination?

I introduced the primary and secondary steps in stratification in Section 13.3.1. The recognition of context, as a language-external stratum in the theory, is *the third and final step* in stratification; it brings the four inner strata of the linguistic semiotic system in relation to the social/cultural system. Figure 13.3 indicates the primary step in stratification by a line dividing the inner ellipse in two halves; this separation indicates the arbitrary relation between signified and signifier, which remains applicable to the two halves of the ellipse as they are further divided by a secondary step in stratification. SFL treats the relations of the two strata of semantics and lexicogrammar as 'natural' in the sense that the default condition of a semantic category is to be 'construed' by some particular lexicogrammatical one: in the last analysis, there is no linguistic meaning without linguistic form, nor is there a meaningless lexicogrammatical form.

These observations are relevant to the concept of realisation: I have suggested (Hasan, 2009b, 2010) that the three strata in the upper half of Figure 13.3, context, semantics and lexicogrammar, are related by a REALISATIONAL DIALECTIC whereby the higher stratum ACTIVATES the lower and the lower CONSTRUES the higher. Speakers do not happen to mean serendipitously in a meaning exchange: the meanings they mean are those called for by the CONTEXTUAL CONFIGURATIONS (henceforth CC), i.e. by the interactants' sense of what is relevant to that social activity at that given point. CC is that abstraction from the context of situation which activates linguistic meanings, activating lexicogrammar. From the addressee's point of view, the lexicogrammar is what construes meanings, and meanings construe the CC, so that a picture of the relevant goings-on is built for the interactants by the relations between the linguistic meanings and relevant elements of the context of situation (Hasan, 1999). This *dialectic* holds context, meaning and wording together (the upper half of the ellipse): stopping at the line of arbitrariness, it does not cross to the lower half of the ellipse.

More pervasive a relation than construal, the relation of activation extends beyond the lexicogrammar to the strata in the lower half of the ellipse in Figure 13.3: in other words, lexicogrammar activates phonology and phonology activates phonetic choices. In this way phonology and phonetics, acting together, realise the lexicogrammatical patterns; *they become the voice of lexicogrammar making the realisations physiologically accessible to the listener*. And while it is true that phonetic units construe the phonological units, in my view, it might be an error to suggest that phonology, especially segmental phonology, with or without phonetics, could *construe* a lexicogrammatical unit in the sense of providing clues to its identity as an instance of a particular category. Theoretically, this would be an anomaly; and speaking objectively, it is not phonology

that helps the addressee recognise whether a lexicogrammatical pattern such as *walks* in some actual syntagm realises plural common noun or a main verb with simple present tense. *It is not the phonological shape of the signifier, but the lexicogrammatical relations accompanying* walks *that unobtrusively provide the criteria for deciding whether a given occurrence of* walks *is the instance of an entity or a process*. This is implicit in the arbitrary relationship of the signifier and the signified; the phonological unit has no affordance for providing recognition criteria for any aspect of the signified: it simply SIGNALS the presence of some associated signified on the basis of conventional practice. The identity and value of the signified is created by the syntagmatic and paradigmatic relations of the concerned units across the strata in the upper half of Figure 13.3. A somewhat different case may be made, perhaps, for prosodic phonology: for example, the options in the system network of KEY are realised as patterns of intonation, and they do make a difference to meaning: but significantly, the locations where the occurrence of a specific intonation can construe a particular meaning has to be specified by reference to the lexicogrammatical environment (Halliday & Greaves, 2008); in other words, they themselves cannot construe the value of the signs in question.

13.3.5 Systems for describing linguistic units

The idea of system in SFL has evolved from Firth (e.g. 1957:7–33, 1968), who used that term (in one of its senses) to refer explicitly to the range of instances capable of functioning as a 'substitution counter' at some element in some linguistic structure.[3] The larger structure in Firth's systemic description would be viewed as a 'context' within which a set of choices were possible, only one of which could occur in an actual case: each choice made a difference to the value of its context.[4] SFL has been refining this concept over the decades: today, working intimately with choice and realisation, system has become a powerful device for the description of language as a meaning potential (Halliday & Matthiessen, 2004; Halliday, 1995b).

All descriptions in SFL are focused on stratal units. Every stratal unit can be either a 'simplex' or a 'complex' of units from the stratum below, implying a range of possibilities for the configuration of constituents in the unit, only one of which can actually occur as an instantiation of the unit at any specific point in a

[3] The graphological form 'system' signifies different meanings in SFL; it refers to the system of language as a whole; to the individual choices dependent on a choice, e.g. imperative system; it is used also to refer to a system network, or any component of it. One feature applies to all its uses: it always implicates choice.

[4] 'Context' is a useful word for showing connections between things; but in SFL it is typically used as an abbreviated form of reference to 'context of culture/situation'. So it may be helpful to use its near synonym 'environment' in other environments.

meaning exchange. In a theory that models language as social semiotic, which in turn characterises language as a meaning potential, the problem the description faces is not: Given the range of possible constituents, how many different unique ways of combining them can be calculated? Rather, the question is: How do the resources of this unit work to produce a range of patterns, each playing a part in the construal of some distinct meaning? The answer to this will depend on which metafunctional perspective is under investigation. Patterns pertaining to a unit, especially at the strata in the upper half of Figure 13.3, are multifunctional, which implies that the choices accessible to the same unit would differ according to metafunctional orientation. From this point of view the choices are not made in terms of the range of the possible concatenations of constituents available to the unit in question. Rather, each unit is a resource for meaning-making in terms of a METAFUNCTIONALLY REGULATED range of features, such that the choice of a feature makes some difference through its realisation to the configuration of a unit's patterning; as I will attempt to demonstrate in Section 13.4, each set of the selected features together with their realisation will represent a valid pattern of the unit, differing from all the others in terms of both meaning and form.

The possibilities of the choice of features are systematically calibrated, being continually redefined on the basis of the choices being made and the relations contracted with other features, i.e. they form a SYSTEM. *A system is, thus, a metafunctionally regulated grouping of calibrated features, capable of specifying the variant values and shapes of a specific unit through the systemic path of the choices and their realisational statements*. Thus, together with the range of choices and the principles underlying their calibration, a system functions as a device for specifying the meaning-making resources of a unit: the description of language is both systemic and functional; its aim is to describe language as a MEANING POTENTIAL rather than as a set of actual structures.

Taking a unit as the POINT OF ORIGIN, each metafunctionally regulated system describes that unit in terms of its meaning potential; the choices in the system are neither items nor structures, but simply a systemised set of opposing features which relate to each other systemically and whose reactance is made manifest in the syntagms created by the realisation statements (discussion in Section 13.4). The following section will attempt to demonstrate how choice, system and realisation work together to describe language as meaning potential.

13.4 How choice works in SFL

In Sections 13.2 and 13.3, I have attempted to build a case for the validity of conceptualising language as a social semiotic system by first tracing the roots of the conception to certain inherent properties of the sign which in turn indicate what an explanatory and explicit description of language as a sign system demands. To describe explicitly the means whereby the signified 'acquires' its

meaning potential, it became necessary to take into account 'the interplay of signs', i.e. the 'morphology of meaning' (Saussure, 2006): this, in terms of SFL, is lexicogrammatical relations. There is a very close relationship between lexicogrammar and language use: reciting a column of the dictionary gets one nowhere in a meaning exchange, and the grammatical structures as configurations of elements are unknowable without lexical flesh.[5] No explanatory and systemic account of language use can be provided without taking into account the regulation of *parole* by the context of culture and situation where the origins of metafunctions lie and where speakers find themselves under pressure to 'voice their meanings', one crucial constitutive step of which is to use the systems of wording (Halliday & Hasan, 1985). With the introduction of the stratum of context into the theory, Sections 13.2 and 13.3 have jointly constructed an outline of some aspects of the theoretical infrastructure – stratification, unit, realisation, system – which supports the description of language as a resource for meaning exchange.

Choice, a theoretically motivated category in SFL, is essential to the systemic description of language as a meaning potential (Section 13.3.5): in this environment it functions as a fine-tuned activator of systemic paths and their realisations. Choosing a feature, here, is equal to identifying how the selection of one feature makes a difference to the meaning-making resources of the unit under description; at the same time it enables an explicit indication of the paradigm of the structural shapes potentially available to that unit, foregrounding in this process the details of the relationships among the members of the paradigm. I believe the best way of demonstrating these achievements is to model the working of choice in the description of some specific unit by presenting a case study. The unit of language I want to use for the purpose is MESSAGE at the semantic stratum (see Figure 13.4), and the specific subclass of *message* under description will be QUESTION, not to be confused with INTERROGATIVE: the default lexicogrammatical realisation of a *question* may be as interrogative but, as will be seen, neither are all *questions* interrogative, nor are all interrogatives *questions*.[6]

13.4.1 Leading up to questions: a systemic description of message

Speakers normally act as if meanings are 'natural'; one 'instinctively' knows what to mean. But the SF linguist must ask, with Labov (1972): *Why does anyone say anything?* One simple answer is: *mostly because the speaker believes*

[5] This is not all that language use does for lexicogrammar. The secret of the evolution of grammar lies in how it is used in the living of life, i.e. the cultural contexts which it helps in bringing about and which in their turn help grammar to grow. This is well captured in Halliday's description of grammar as 'the theory of human experience'.

[6] Italics are used for terms at the semantics stratum.

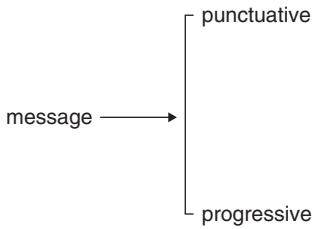


Figure 13.5. Message as point of origin for a primary and simple semantic system

the occasion of talk demands it. This, in keeping with the claims in Section 13.3, ascribes the responsibility of the activation of *parole* to the context of situation, and by the same token it is no longer a semiotic choice; it becomes a cultural one, 'prompted' by what is going on in the social context. This need not necessarily stop the choice from being systemic, but I will not offer an account of its activation in terms of the 'systemic features of context': system networks of context do exist but they are in a nascent stage, despite efforts by some scholars (e.g. Hasan, 1999, 2009c; Bowcher, 2007; Butt, 2004; Matthiessen, 2012).[7] So I will just assume that the asking of a question is taken by the interactants as a contextually relevant act.

13.4.2 The first step in describing how units enact relations

With that assumption I will begin from the earliest point in the history of the semantic unit *question*. It is a subclass of the unit *message*. So *message* is the point of origin for the first systemic choice (see Figure 13.5). As the first system following the point of origin, it is by definition a PRIMARY SYSTEM. It also happens to be SIMPLE: its features bear the single relation of mutual exclusion. Speaking technically, system is primary, simple and DEPENDENT; it should be read as: **IF** the given environment is *message* **THEN EITHER** the choice of the feature PUNCTUATIVE **OR** of PROGRESSIVE applies.

Dependency is an inherent condition of every system: the existence of the system is predicated by choice being made available under some *condition*: nothing can be a system unless the features that form the system are mutually exclusive; no matter how many features there may be, each will bear the either/or relation to the others. It is graphically indicated as a right-facing open square bracket (see Figure 13.5).

[7] It is not clear if Matthiessen's account of context is a systemised description; the visual representation differs, and more importantly, there are no systemic realisational statements invoking categories of meaning associated with specific elements of context.

The feature *punctuative* is a resource for a message enabling the 'management of ongoing interaction', e.g. 'hullo', 'goodbye', 'sorry!', 'pardon', 'you know what?', 'wow!', 'how d'you do?', 'hey, you there!' and so on. Normally occurring in the spoken mode, it is typically realised as a minor clause: the crucial requirement is that grammatically the clause is non-productive; it does not form structural paradigms. By contrast, the default realisation of the feature *progressive* is a major clause: essential for continued interaction, it participates in the performance of every kind of social practice that is not performed by the *punctuative message*. Example (1) (from Hasan, 2009a) presents an extract from a naturally occurring dialogue between three-year-old Karen and her mother.

KAREN: (25) how did you get that? . . .
MOTHER: (26) mm?
KAREN: (27) how did you get that? (28) you didn't get out of [?]
MOTHER: (29) I walked over (30) and got it (31) didn't you see me?
KAREN: (32) nup
MOTHER: (33) you must be blind

Here only message (26) is *punctuative* (a variety of 'sorry/pardon'). The remainder are all *progressive*.

13.4.3 From system to system network: increasing descriptive delicacy

A system represents an analyst's hypothesis about the properties of the unit under description. To be valid, the hypothesised description requires the 'renewal of connection' with actual instances of the unit: it must meet the requirements of the realisation statements attached to the choices along all the systemic paths in the system. A system may be maximally valid without being descriptively efficient. A trivial example of this is the primary system in Figure 13.5: implicit in it is the eminently verifiable hypothesis that every English *message* is either *punctuative* or *progressive*. But because the subcategories of messages are defined only in terms of one single relation in a primary system, its descriptive efficiency is low: it will fail to indicate most of the unit's resources for meaning. Even if there had been a bigger range of choices in the dependent primary system, for obvious reasons the description could not improve in efficiency. What is needed is both the density of choices as well as the validity of hypotheses to ensure descriptive efficiency: the greater the depth of the valid systemisation of choice, the more detailed the analysis of the unit.

It is this fact that provides the impetus for developing an individual system into a SYSTEM NETWORK (sometimes called simply 'system' or 'network') together with testable realisation statements. After the primary system, the formation of a system network depends on a systemic choice itself 'turning

into' an ENTRY CONDITION, that is to say, a choice becomes the environment for further systemically related feature(s) to choose from: simplifying, a choice made may act as the gateway to choice(s) to be made. Technically known as SECONDARY SYSTEM(S), each of these systems provides more distinctive details about the unit under description, thus adding to the depth of the unit's description. The set of choices related to each other in this way is known as a SYSTEMIC PATH, and the set of choices made along that path is called a SELECTION EXPRESSION. Each selection expression provides a systemic description of a subclass of the unit under description. System networks can thus be measured for their depth of detail, the technical term for which is DELICACY. The simple primary system yields the 'least delicate' description; the 'most delicate' point of description is reached at the last choice of a systemic path, when the description cannot proceed any further.[8]

13.4.4 Choice as entry condition to simultaneous systems

As noted above (Section 13.4.1), access to a dependent system means that one and only one choice must be made from that system. Sometimes the same choice allows entry simultaneously into more than one system. Such systems, however many there may be, are known as SIMULTANEOUS (or CONCURRENT) SYSTEMS. This happens in Figure 13.6, where, using the feature *progressive* as a simple entry condition, the beginnings of a polysystemic description of *progressive message* is presented. Through the discussion of Figure 13.6, I hope to introduce other types of systemic relations while drawing closer to the category of *message* called *question*.

The biggest left-facing open brace in Figure 13.6 indicates the simultaneity of the four vectors which identify the metafunctional regulation of the systems, with the implication that choices from each vector will apply simultaneously to any *message* with the feature *progressive*. The first, RELATION ENACTMENT, indicates interpersonal regulation;[9] the second, CONTINUATION, textual; the third, AMPLIFICATION, logical; and the last, CLASSIFICATION, experiential. The number of systems in each vector is not identical, but each leads to simultaneous systems, which is to say that the choice *progressive* has allowed access to all four vectors and to the simultaneous systems pertaining to each. The network will develop by choosing from these systems.

The simultaneous systems are a collection of distinct dependent systems, all made available by the same entry. So when it comes to making choices

[8] This happens regularly in the description of 'fully grammatical classes of word', e.g. those functioning as DEICTIC in a nominal group. It is also feasible to reach this completion point in describing 'content words', i.e. LEXEMES, but this has rarely been attempted in practice (Hasan, 1985b, 1987; Tucker, 1998).

[9] I have recently adopted 'relation enactment' as the most inclusive term. This term replaces 'rhetorical stance', which had replaced 'role allocation'.

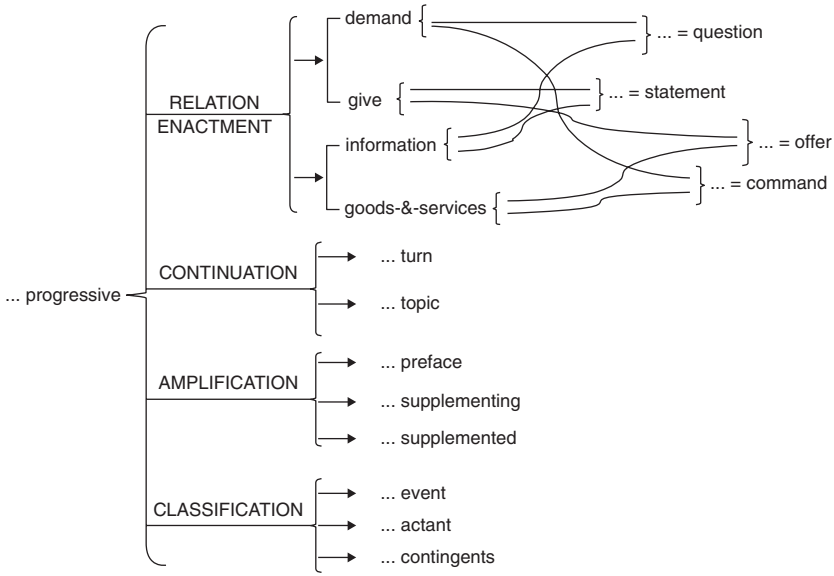


Figure 13.6. Choice as entry condition: simultaneous systems

from those individual systems, the same principle applies: one feature may be chosen in each such system; but because there are two or more such systems simultaneously dependent on the same choice, this logically results in a principle for accessing choices known as a **BOTH–AND** choice: **BOTH** one choice from this system **AND** one from the other simultaneous one(s). To illustrate, in Figure 13.6 the choice *progressive* allows access **both** into the system with the features *give*-or-*demand*, **and** into the system *information*-or-*goods-&-services*. It is possible, though not required, that each feature of the first system is co-selected with each feature of the next one(s) – in fact this is what happens in Figure 13.6) – this multiplies the number of features that become part of the descriptive detail. It follows that two or more simultaneous systems, even if each is simple, consisting of only two choices, will potentially provide more descriptive detail together than a single dependent system could have. So entry to simultaneous systems can be viewed as another way of adding to the degree of delicacy in description. In general terms, it may be concluded that relations which a choice enters into make some significant difference to the description of the unit, whether this is due to choices functioning as some kind of entry condition or to requiring a particular pattern of choice access. For this reason it will be important to look into the meaning of these relations as much as into the realisational implications of the choice of particular features.

Simultaneous systems typically form part of a system network; and, in fact, each vector shown in Figure 13.6 has been developed into a system network (Hasan, 1983), though in this chapter, interest is limited to the two simultaneous systems introduced by the relation enactment vector because it is here that the category of message called *question* is located; besides, it can be used to illustrate three different kinds of complex entry condition.

13.4.5 Complex entry conditions: conjunct entry

The most frequent entry type is a SIMPLE ENTRY CONDITION. In this kind of entry the *choice of just one single feature* functions as the condition for entry into either one single dependent system or into some simultaneous systems. Thus in Figure 13.6, a single feature *progressive* allows access to all four metafunctionally regulated vectors and therefore to the systems governed by each vector. In a COMPLEX ENTRY CONDITION, *more than one choice* stands in some specific relation in order to enter (a) subsequent system(s) whether single or simultaneous. The development of the *relation enactment* systems in Figure 13.6 helps illustrate one particular type of complex entry condition.

Note that in Figure 13.6, each choice in one system combines with each choice from the other so that in each case two distinct choices from two distinct systems combine validly (see Section 13.4.4 above): this conjunction is a condition for access to some choice(s) from a subsequent system. When two or more choices from two or more systems combine to create the environment to access subsequent systemic choice(s), this is called a CONJUNCT ENTRY CONDITION. For obvious reasons this complex entry condition is available only in the environment of simultaneous systems. The combination of two choices is by far the most common but in principle any number of choices can combine to function as a conjunct entry condition. As Figure 13.6 shows, small braces play an important part in signalling these types of entry: the left-facing small open braces show a conjunction of lines which connect with the two (or more) features forming the conjunct entry condition; conversely, where the same feature enters into two distinct entries, this multiplicity is indicated by the lines in the right-facing small open braces which are placed close to the feature in question. So *demand* combines with *information* to form one conjunct entry condition that gives access to the system of choices for asking *questions*; and *demand* also combines with *goods-&-services* to form another conjunct entry condition which gives access to the system of choices relevant to issuing *commands*.

Altogether four conjunct entry conditions have been created by the combination of choices in the simultaneous systems in *relation enactment*; each providing entry to a more delicate system for some category of *message*,

Table 13.1. *Default function of conjunct choices: relation enactment*

E1choice; E2choice	Function of message	Examples of functions
demand; information	Question	(i) What's the matter Kristy?
give; information	Statement	(ii) I can't get this on
demand; goods/services	Command	(iii) OK bring it over here
give; goods/services	Offer	(iv) and I'll help you

as the label for each shows. The meaning of these labels may not necessarily correspond with their common usage. For example, an *offer* in terms of analysis includes 'promise', which in terms of the description is simply a *distant offer*, as opposed to *invite*, which is *immediate*, as opposed to *urge* which is *insistent*:[10] the entire system network will be predicated on the conjunction of the feature *give* and *goods-&-services*, which is the point of any kind of *offer*. Table 13.1 presents each of the categories identified in Figure 13.6 as they occurred naturally in a dialogue between a mother and her daughter.

The systemic paths pertaining to each of the utterances in Table 13.1 are stated in the first column of the table: they await entry into the more delicate system networks (e.g. that shown in Figure 13.7). Each category of these *messages* will be realised as a major clause; their DEFAULT and CONDITIONED realisations can be stated by reference to the lexicogrammatical choices from the system of MOOD, which, like *relation enactment*, is an interpersonally regulated system.[11]

Before leaving this discussion, it is clear that systemic descriptions demand space and time. The graphic representation serves the purpose of placing the analyst's hypotheses about the unit's description up front; the realisation statements are condensed indicators of what needs to be said about the function and form (i.e. shape) of the signs under description: they do not constitute description in detail. Chapters of the present kind can hardly accommodate a delicate description of even one familiar category such as *question*. So while the system networks I present (though far from being exhaustive) hint at the resources of English for meaning exchange, not much detail of these resources can be provided here. Often the presence of systems can only be indicated by dots. For example in Figures 13.6 and 13.7, the dots indicate

[10] Of course many other choices are relevant as well to each such distinction.

[11] For some discussion of default and conditioned meaning–wording relations see Hasan (2011:355ff.).

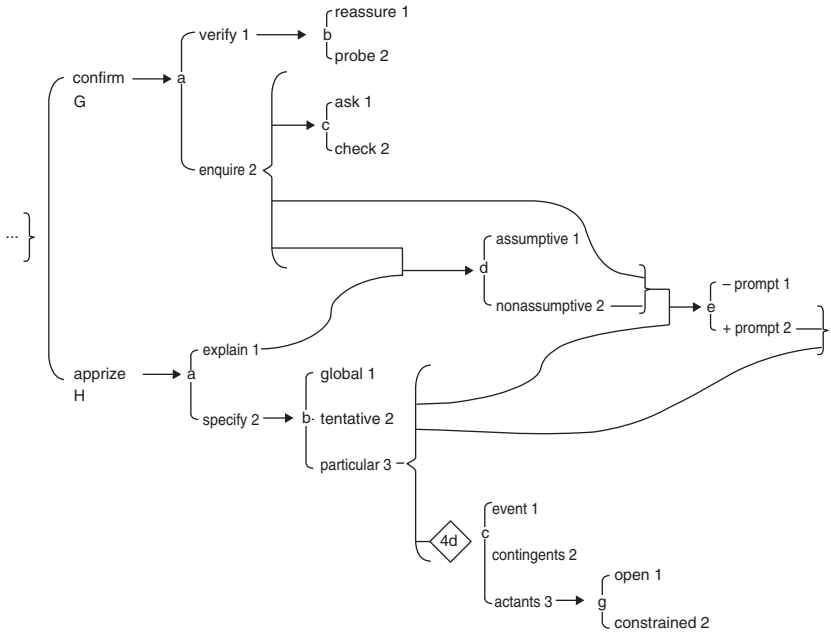


Figure 13.7. Choice in asking questions: a simplified system network

the locations where some system networks and/or their details have remained undisplayed.

13.4.6 Systemic choices for asking questions with complex entries

Access to the system network in Figure 13.7 is provided by the conjunction of **both** *demand* **and** *information*. As pointed out above this figure represents the semantic choices designed to describe the sub-category of message *question* up to a certain degree of delicacy.[12]

The first system accessed here is a single and simple dependent system with the options CONFIRM and APPRIZE. For ease of reference, the latter have been labelled as G and H, respectively: these letters refer to two choices which form the foundation of the entire remaining set of subsequent systemic choices in the question system network; ultimately everything in this network depends on **either** *confirm* **or** *apprize*. The systems and choices in each part, G-systems or

[12] The system of choices presented here is the most recently revised form of earlier versions, some of which have appeared in Hasan (2009a).

Table 13.2. *The common systemic history of G-/H-systems*

Semantic feature	↘ LG feature	↘ LG structure
message	↘ go-to clause	↘ constituents group/phrase
progressive	↘ major	↘ insert Predicator → Pred
demand; information	↘ go-to MOOD	↘ insert Mood → Mood• Pred
G – confirm	↘ indicative	↘ expand Mood → S • F • Pred
H – apprize	↘ interrogative: non-polar	↘ insert interrogative marker preselect wh-/ S • F • Pred

LEGEND:
↘ = realisation statement
→ = resulting structural description
• = order in sequence not specified
/ = conflate per instruction
LG = lexicogrammatical

H-systems, have been identified by numbers starting at 1 for each individual system in each part. Lower-case letters starting with a in each part identify the individual system to which those numbers pertain. Thus in G-systems, the letter a on the first arrow following the feature *confirm* and the numbers in the system dependent on it must be read as: 'the feature *confirm* is the entry condition for the individual dependent system a consisting of a choice between feature a1 *verify* and feature a2 *enquire*'. This address of systemic choices has proved unambiguous; thus Ga2:c1 says 'in G-systems the features *enquire: ask*'.

The presence of the left-facing small open brace initiating Figure 13.7 indicates that the systemic path for *confirm* and *apprize* is identical until the selection of these features: when those features are selected the systemic paths of the two are set on different courses. Column 1 (Table 13.1) showed their common history. Table 13.2 offers brief realisation statements attached to each feature in the systemic path up to the point where their common history diverges, i.e. at *confirm* vs. *apprize*.

To say that at *confirm* vs. *apprize* systems diverge is to say that up to this point they had a common systemic path (as shown in column 1 of Table 13.1); from this point onwards the actual features in their selection expressions will differ from each other. Even if they come together at points, their realisational statements will never be the same after a divergence. The discriminatory function of either/or ensures this. The pre-entry systemic history, i.e. selection of features and their realisational statements, becomes part of the history of the newly chosen feature, but each subsequent choice will change that history. If I understand correctly this is what Mann (1985) was referring to when he introduced the concept of REALISATIONAL INHERITANCE (RI); these are choices

associated with a systemic path up to some particular point identified by reference to 'choosing points'. Nothing in it can be deleted, contradicted or altered (except in degrees of delicacy) at the integration of the new choices joining that systemic path. The principle is clearly necessary to ensure the validity of description.

By these devices, a series of what Saussure (2006) called 'templates' would be created where each member of the paradigm would differ from the others, often in terms of one single systemic choice. But if so, Saussure's 'template' cannot be equated with an 'orderly ordered syntactic structure'.[13] He appears to have differentiated rigorously between templates and structures as they occur in the syntagm of some instance of *parole*. Templates have a direct relation to the 'morphology of meaning', and they seem to be built on a stable relation between meaning and its realisational devices. A template thus has greater stability in the bond between meaning and wording. To my mind it is very much like a feature in a semantic system network and its realisation in terms of lower strata, particularly lexicogrammar.

If I am correct, then what Saussure is asking linguistics is to provide reliable information about the entire set of templates pertaining to some linguistic sign system whose instantiations are encountered in *parole*, where they occur with some combinations and variations as the range of actual structures. As pointed out, SFL accords equal status to every metafunction: the implication is that the description of units cannot be deemed complete unless the contribution of each metafunction to the meaning-making resources of a unit has been sufficiently described. Halliday's arguments (e.g. 1979a) suggest that templates must be metafunctionally distinct; and they must be calibrated to show how language enacts relations, construes experience, maintains relevance, and observes semiotic logic, all of this simultaneously in the same utterance(s). This is what the volumes of *Introduction to Functional Grammar* (e.g. Halliday, 1994a) have been attempting to model. With these general remarks, I turn to some choices for asking questions in English.

13.4.7 Systemic choices for asking questions, and their realisations

The G-systems describe the sub-category popularly known as 'yes/no questions' while the H-systems describe 'wh-questions'. This is already an indication of the distinct paths to be followed by the systems dependent on *confirm* as opposed to *apprize*. Table 13.2 does not provide specific structural shapes for any choice: although *confirm* or *apprize* as sub-categories are clearly more delicate than *progressive* or *punctuative*, their description is still at an initial

[13] I am attempting to use this term as in Saussure (2006); and the comments I make at this point are based on my understanding of this fragmented writing.

stage; and the ordering of structure at an early point could pose problems when that degree of delicacy is reached where 'Who did that?' and 'What were you eating?' are differentiated. They are both wh-questions, but only the structure of the second allows the canonical 'interrogative' ordering of elements; but for the presence of *who* as Subject, the structure of the message 'Who did that?' resembles a declarative order. Note that both sub-categories of question (G-systems or H-systems) carry information about their QUERY POINT; this provides a measure for recognising an 'adequate answer'.

The choice of the feature *confirm* (Figure 13.7) acts as a simple entry condition to a single dependent system with the choice VERIFY or ENQUIRE. The realisational inheritance of the choice *verify* will include everything up to the point of origin: this follows from the discussion of RI and the information supplied in Table 13.2. The realisation of the choice *verify* would add the following details to that realisational inheritance: the clause realising this choice would select the lexicogrammatical choice [DECLARATIVE: TAGGED]; and the instruction to order elements S • F • Pred (Table 13.2) as S^F^Pred . . . ^F^S. The choice of *verify* gives access to the dependent system of options, either REASSURE or PROBE. The realisation statements of these choices will specify more delicate information about the realising clause: the choice *reassure* is an instruction to select the feature [REVERSED polarity] in Tag, whereas for *probe* the lexicogrammatical feature [CONSTANT polarity] must be selected in Tag. The polarity of a 'reversed tag' reverses the polarity in the clause: if the clause is positive, the tag must be negative and vice versa. With 'constant tag', the polarity of the tag is the same as that in the clause. The difference between these two categories of question is fairly delicate: a message with the choice *reassure* seeks reassurance that the speaker's voiced understanding of some event is shared by the addressee: the unmarked expectation is that the polarity in the answering clause would agree with the polarity of the realising clause. By contrast, a message with the choice *probe* seeks to find out whether something is the case or not: the unmarked expectation is that the polarity of the answer would agree with that in the tag.[14]

The choice *enquire*, which contrasts with *verify*, is relevant to three systemic entries: two of these systems are simultaneous. System c offers a choice of either ASK or CHECK: the choice *ask* is realised as [INTERROGATIVE: POLAR], e.g. 'Are you leaving?' or 'Has he arrived?', with obvious consequences for instructions about the formation of their lexicogrammatical structure. The choice of *check* is realised as [declarative: NONTAGGED], on Tone 2: the former are

[14] When these semantic networks were first designed (Hasan, 1983) the relevance of the key system (Halliday & Greaves, 2008) to the interpersonal meaning of clauses was not as obvious to me. Today, by bringing in this information, the meanings of the choices would certainly be increased a good deal.

'straightforward yes/no questions', whereas the latter are 'yes/no questions with an attitude'. For example, saying 'You are leaving?' on Tone 2 would normally be interpreted as asking for a 'yes/no' response while showing surprise, concern or some other reaction (e.g. 'Let me get your coat for you!'). The other simultaneous system to which *enquire* gives access consists in the choice of either ASSUMPTIVE or NONASSUMPTIVE. Here the latter choice is clearly implicated in a complex entry, as indicated by the lines and brackets in its environment. This is discussed in Section 13.4.8 together with another complex entry. First, a word about H-systems, which are implicated in both cases of complex entries.

The choice of the feature *apprize* allows choice from the system: either EXPLAIN or SPECIFY. The realisation of both these features will be through the selection of the lexicogrammatical features [interrogative: non-polar].[15] With *explain*, it also carries the instruction 'wh- conflates with Adjunct, realised as a causal adverb': the most frequent item to actualise this instruction would be 'why', less likely 'what for', and very much less likely 'for what reason'. Two examples: 'Why does Nana like that chair?' and 'Why does it fall down?'. The choice *specify* questions some details of event structure: so the more delicate choices it enables access to are GLOBAL, TENTATIVE, PARTICULAR. The choice *global* enquires about the overall goings-on, as in 'What's going on?' or 'What happened?'; the *tentative* leaves the state of affairs unclear, naming just one component of it, as, for example 'What about cat?'; and with the choice *particular* the message raises the question about some particular aspect of the state of affairs. Hence the set of choices in c EVENTS or CONTINGENTS or ACTANTS. One might ask, for example, 'What were they doing?' or 'What happened then?' (c1 *event*); or 'Where do you do your shopping?' or 'When did you see him last?' (c2 *contingents*); or 'Who told you that?', 'What were you reading?' (c3 *actants*). As is obvious from the examples, the realisation of all these choices will call for the lexicogrammatical features [interrogative: non-polar], and their transmutation into syntagms will call for preselections and conflation of specific classes of groups with the wh-. As Figure 13.7 shows, *particular* is the entry condition to two other choices. These will be discussed below with the complex entry conditions.

13.4.8 Do divergent systemic paths rejoin? On disjunct entries

Complex entries always implicate more than one choice, each pertaining to two distinct systems. Thus in a conjunct entry condition, two or more choices, each from distinct simultaneous systems, together form the environment for

[15] As Table 13.2 shows, it is assumed that the realisation of [interrogative: non-polar] does not always imply the order F^S.

Table 13.3. *Selection expressions and realisation of some choices*
Assume for every systemic path as given message: progressive: demand; information ↘ clause: major → S • F • Pred

Selection expressions	LG features	LG structures	Examples
G:			
confirm: verify: reassure	declarative: tagged: reversed	S^F pos^P . . . F neg^S OR*	You like sugar, don't you?
		S^F neg^P . . . F pos^S	You don't like sugar, do you?
confirm: verify: probe	declarative: tagged: constant	S^F pos^P . . . F pos^S	You like sugar, do you?
		S^F neg^P . . . F neg^S	You don't like sugar, don't you?**
confirm: enquire: ask	interrogative: polar	F^S^P	Do you like sugar?
confirm: enquire: check	declarative: untagged Tone 2	S^F^P	You like sugar?
H:			
apprize: explain	interrogative: non-polar	Wh-/Adj^F^S^P (wh-preselects why as Adj)	Why do you like sugar?
apprize: specify: particular . . . event	interrogative: non-polar	Wh-/C^F^S^P (wh-preselects what as C)	What did you cook for dinner?
apprize: specify: partic . . . contingnt	interrogative: non-polar	Wh-/Adj^F^S^P (wh-preselects where as Ad)	Where did he go?
apprize: specify: partic . . . actants	interrogative: non-polar	Wh-/S^F^P (wh- preselects who as S)_	Who was calling?

* When two systematically differing realisations are possible, as here, there is a strong case for further research on what principle underlies this regularity; it is likely that there is a systemic meaning distinction which can be made.

** This is normal usage in some varieties of Australian English.

access to a more delicate system of choices (see Section 13.4.5). There is, however, a complex entry condition where (i) two or more choices function as the entry point to a more delicate system; and (ii) both access the same system, but; (iii) unlike choices forming a conjunct entry, they do not combine to achieve this end; they access the more delicate choice separately; and (iv) the choices so selected become part of separate systemic paths. This kind of separate access to the same system by two or more options from distinct systems is called DISJUNCT ENTRY CONDITION. It is illustrated in Figure 13.7, and the choices implicated in that entry are *enquire* in G and *explain* in H. The system to which both get access is *assumptive* or *nonassumptive* (see Section 13.4.7). It is as if, their paths having diverged, they are brought back into contact through their participation in accessing the same system. However, due to the previous divergence they cannot combine, each gaining access to the same system of choices *mutually exclusively*. The latter system thus represents choices that the two systemic paths have in common despite belonging to different sub-categories of *question*. Here are the details of this entry.

As the left-facing open brace in G-systems (Figure 13.7) shows, the choice *enquire* allows entry into two simultaneous systems: c *ask* vs. *check* and d

Table 13.4. *Disjunct entries to the same system by choices in distinct systems*
Assume as given for every systemic path message: progressive: information ↘ clause major → S • F • Pred

Selection expressions	LG features	LG structures	Examples
confirm: enquire: ask; assumptive	interrogative: negative	F neg^S^P	Didn't you see me?
confirm: enquire: check; assumptive	declarative: negative: +Tone 2	S^F neg^P	You didn't see me?
confirm: enquire: ask; nonassumptive	interrogative: positive	F pos^S^P	Did you see me?
confirm: enquire: check; nonassumptive	declarative: positive: +Tone 2	S^F pos^P	You saw me?
apprize: explain: assumptive	wh-/ interrogative: neg	wh-/Adj^F neg^S^P preselects *why*	Why didn't you call?
apprize: explain: nonassumptive	wh-/ interrogative: pos	wh-/Adj^F pos^S^P preselects *why*	Why did you call?

assumptive vs. *nonassumptive*. The former has already been described (see Section 13.4.6 and Table 13.3). With the choice *assumptive* the realising major clause must have negative polarity, as in 'Didn't you see me?' {= *ask; assumptive*}or 'You didn't see me?' {= *check; assumptive*}; asking such questions implies that the speaker assumes the addressee should in all reason respond 'Yes, I saw you' (Hasan, 2009a). By contrast, the feature *nonassumptive* is realised as a major clause with positive polarity, as in 'Did you see me?' or 'You saw me?' This description of *assumptive* vs. *nonassumptive* stands also when the system is accessed by the choice *explain*, as evident from a comparison of 'Why don't you love Rosemary?' with 'Why do you love Rosemary?' It is part of the same story that, due to their distinct RIs, the realising clause for *enquire* will interrogate with *ask* and declarative +Tone 2 with check, while for *explain*, it will be a non-polar interrogative preselecting *why* as detailed above (see Section 13.4.7). However, their systemic paths remain distinct, as evident from Table 13.4.

There are other ways of graphically representing these disjunct choices: the system of choice *assumptive/nonassumptive* could have been inserted twice, once as part of G-systems, allowed entry by the choice *continue*, and then again as a dependent system entered by *explain* in H-systems. In that case the G-/H-systems would never have been shown to be in contact, and in practical terms there would have been fewer lines in the network: the formal information would be easy to read. However, the point of the information would have been lost, namely that two major sub-categories of *question* differ from each other but they are also similar by sharing the same semantic options despite belonging

to distinct systemic paths. This 'coming into contact' of G-/H-systems is not accidental: their early history is the same, and they come into contact again via a second disjunct entry condition, accessed either by the choice of {enquire; nonassumptive} in G-system or by {specify: particular} in H-system; the system of choices they enter separately is e, –PROMPT or +prompt. But a price has to be paid for the insistence on maintaining both formal and functional information: this explains the complexity in access to either *–prompt* or *+prompt*.

Basically two facts are important here: (i) the choice of *–prompt* or *+prompt* may be accessed either from the feature *nonassumptive* in G-system or from *particular* in H-system; (ii) Table 13.4 shows clearly that *nonassumptive* enters into three distinct systemic paths: two pertain to G-systems {*enquire: ask; nonassumptive*} or {*enquire: check; nonassumptive*}; the third pertains to H-systems {*explain: nonassumptive*}. The question now is whether the choice of either *–prompt* or *+prompt* is available to all three paths. It turns out the answer is negative: the path with {*explain: nonassumptive*} cannot enter the choice of either *–prompt* or *+prompt*. The conjunction of *enquire* and *nonassumptive* in G-systems represents these facts: it says '**if** the path has {enquire: nonassumptive} **then** it has access to either the choice *–prompt* or *+prompt*. But the entry into the latter system is disjunct: the other path of entry is from *particular*, which, as is the case with disjunct entry conditions, separately chooses either *–prompt* or *+prompt*. Thus the system notations explicitly indicate the exclusion of {*explain: nonassumptive*} from the latter choice.

What choices are these, and what difference do they make to a *question*? Table 13.5 shows the paths of choice and their lexicogrammatical realisations. An example of a G message with *+prompt* would be 'Did granny say that or daddy?' As a message with the choice *verify* in its systemic history, it ought to be answerable as yes/no, but quite clearly this is not likely with a *+prompt question*: the choice +prompt calls for a response which to be adequate needs to provide a specific piece of information: either granny said that or daddy did. The same applies, *mutatis mutandis*, to the H message. An example would be 'What are you eating, an apple?': here the *adequate* answer is 'yes/no'. The H systemic path has an additional systemic choice: it may have a *simple* or *alternative* prompt as in 'Who's cooking dinner, you or me?' Here, unlike the last example, yes/no would not be an *adequate* answer; it will have to be either 'you' or 'me'. Now, it is worth noting here that there do not appear to be any English *messages* such as: 'Why did he stay home, because ill?' In other words, the exclusion of {*explain: nonassumptive*} from access to choice from *–prompt* or *+prompt* appears to be validated. Of course, in all these cases other kinds of responses are possible, but they carry their own 'semantics', which is not part of the present story. Table 13.5 displays the relevant parts of the systemic paths and their lexicogrammatical realisations.

Table 13.5. *A disjunct entry condition with a difference*

Relevant selection expressions*	Realising features	Examples
confirm: enquire: ask; nonassumptive: –prompt	interrogative: positive	Did granny say that?
confirm: enquire: check; nonassumptive: –prompt	declarative: positive + Tone 2	Granny said that?
confirm: enquire: ask; nonassumptive: +prompt	clause complex: 1 ↘interrogative: positive +2 ↘ elliptical except for 1 element	Did granny say that or daddy?
confirm: enquire: check; nonassumptive: +prompt	clause complex as above but 1↘ declarative +Tone 2	Granny said that or Mum?
. . . specify: particular: –prompt . . . **	wh-/interrogative	What's she doing?
. . . specify: particular: +prompt: simple; event	clause complex: 1↘wh-preselects *what*: interrogative	What's she doing, singing?
. . . specify: particular: +prompt: simple; contingent	+2 "elliptical except for Pro (main verb)	When's Dad coming, tonight?
. . . specify: particular: +prompt: simple; actant	clause comp: 1↘wh-preselects *where/when:* interrogative	What're you eating, an apple?
. . . specify: particular: +prompt: alternative; event	+2 "elliptical except for Adjunct (phrase)	What's she doing, sleeping or reading?
. . . specify: particular: +prompt: alternative; contingent	clause comp: 1 ↘ wh-preselects *who/what*: interrogative	When's Dad back, tonight or tomorrow?
. . . specify: particular: +prompt: alternative; actant	+2 "elliptical except for S/C (nominal)	Who's cooking dinner, you or me?
	clause complex: 1 ↘ wh-preselects *what*: interrogative	
	+2 "elliptical except for Pro (verbl grp complex)	
	clause complex: 1 ↘ wh-preselects *where*: interrogative	
	+2 "elliptical except for Adjunct (phrase complex)	
	clause comp: 1 ↘ wh-preselects *who/what*: interrogative	
	+2 "elliptical except for S or C (nom complex)	

* The total number of choices and the order of choice selection in the systemic paths of G-/H-systems can be easily calculated by putting Tables 13.2–13.5 together; for lack of space the realisational statements are regrettably highly condensed.

** The choice *particular* gives access to choices in system c in H: thus every systemic path with the feature *particular* must be followed up by **either** *event* **or** *contingent* **or** *actant*, as well as **either** *–prompt* **or** *+prompt*; and **if** *+prompt* is chosen in the systemic path, this must be followed by **either** *simple* **or** *alternative*; the entire range of systemic paths has not been presented here for *–prompt* in H.

13.5 Conclusion

In this chapter I set out to establish that choice is a theoretically motivated term in SFL. To this end, I substantiated SFL's concept of language as a social semiotic functioning as a resource for meaning. Choice with system and realisation is the main instrument in achieving the SFL objective of describing language as a meaning potential. My claim is not that such a description of the language has been fully accomplished, simply that the theoretical machinery to achieve this goal is in place. Modern linguistics has in general accepted that a linguistic sign is known by its value, and that value is the artefact of the relations in which signs participate. The 'interplay of signs' is, thus, one of the most important areas to explore in understanding language as a meaning potential: this is basically what I hope choice, system and realisation have demonstrated in Section 13.4 by working with the features pertaining to the unit of *message*. But message is not unique; each unit on the inner strata of language, especially on the higher two strata, is expected to reveal a similar organisation. The features combine, diverge, and are affected by their environment: their capacity to create delicate meaning distinctions appears almost infinite. Choice is active in shaping the system by specifying the relations of features; and the validation of the working of both through realisation depends on the description's renewal of connection with the speaker's experience of meaning in action.

These theoretical metaphors enable the analyst to enter into an explicit discourse on how language as a semiotic system becomes a powerful resource for the exchange of meanings in social contexts. Each choice of a systemic feature identifies one element of difference/similarity across classes of units by the systemic relations that the feature contracts with other features of the same unit; this interplay of features rather than of items is 'translated' into the unit's value. The unit's value identification is not completed in one step by examining one unit at one stratum: it demands also the realisational journey up and down the strata, across the scale of units at each stratum, until the description comes face to face with 'substance' in the shape of phonological entities, made sensible either as sound or graph; ideally, that is when the identification of meaning in language is achieved. Real language is highly complex: to locate it simply in the brain, or simply in a culture, simply in the template or in the syntagms, cannot do justice to it. Nothing shows this more clearly than the working of systemic choices grounded in realisation.

Choice as in choice of meaning is not the same thing as choice when used to describe the construal of meaning in language. Systemic choice as used in the description of *any language-internal unit* has no concern with individuality, freedom, will or all those other qualities that dictionaries assign to the act of choice. It is simply a metaphor for linking one feature with other relevant ones whose patterning underlies the linguistic pattern, making explicit how it comes

to have the value it has. Choice, system and realisation together represent one critical aspect of the semiotic mechanism whereby the linguistic sign comes to have some conventionally shared meaning in speech fellowships. Individuals may and do choose whatever meaning they want to; they may or may not act relevantly, appropriately, conformingly; this may be intentional or not. None of this has anything to do with the inner workings of language. The inner workings of language through choice, system and realisation act only in respect to the creation of that conventionally accepted meaning which Saussure called signified, expressed by its signifier.

14 'Choice' in relation to context: a diachronic perspective on cultural *valeur*

Claire Urbach

14.1 Introduction

The notion of 'choice' is invoked as a concept in SFL in different ways for different units of analysis. At clause rank, when dealing with the semantic and lexicogrammatical strata, 'choice' is used to describe the unconscious process of selection from the meaning potential to create a text instance in a given context (see e.g. Halliday, this volume). But when we move to consider context, the idea of selection from a potential no longer seems to fit so comfortably. Indeed, Halliday (this volume) suggests that existing networks of choice for context are really no more than 'taxonomies of semiotic situation types'. What is the unit of analysis at the contextual stratum? What is the potential from which options are selected? By what means does the selection take place? What entry conditions might exist for beginning a selection path through a system? (See Halliday, this volume, for a discussion of system and system networks at the linguistic strata). These questions cannot all be answered satisfactorily here, but they are raised to acknowledge that theoretical difficulties exist, and that as a result some assumptions will need to be made in this chapter about the utility of a paradigmatic view of context for the study of register.

As part of the multi-perspectival account of the notion of choice presented in this book, the present chapter offers a diachronic perspective on choice at the contextual stratum and its articulations with the lower strata. In this chapter I will present some diachronic data (news reports from the *Sydney Morning Herald*, 1902–2003) and bring the findings of linguistic and contextual analyses to bear on the issue of choice in context. The discussion of lexicogrammatical patterns such as tense selection and their implications for context will highlight the

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necessity of investigating the contextual stratum as an extralinguistic 'ground' against which to properly understand and evaluate the linguistic choices. Since investigating context can be so important for establishing comparability or difference (particularly in studies of register), efforts to model the contextual stratum systemically and clarify the meaning of 'choice' at this stratum are particularly urgent.

14.2 Context as choice?

The sense of ill-fit between the notion of choice and the stratum of context alluded to above is probably due in part to the fact that the conception of context as a system, potential or paradigm is not as stable in the theory as systems at other strata, although it has certainly been discussed for several decades (e.g. Halliday & Hasan, 1985; Hasan, 1995, 1999, 2009c; Butt, 2004). In SFL, 'context of situation' is a theoretical construct that makes abstraction from experience for the purposes of analysing the relationship between social context and text (cf. Firth, 1968; Hasan, 1995). Halliday explains that, in Malinowski's work, both context of situation and context of culture were considered "necessary for the adequate understanding of the text" (Halliday & Hasan, 1985:7), because, "involved in any kind of linguistic interaction, in any kind of conversational exchange, were not only the immediate sights and sounds surrounding the event but also the whole cultural history behind the participants, and behind the kinds of practices that they were engaging in, determining their significance for the culture, whether practical or ritual" (Halliday & Hasan, 1985:6). So it would seem that the 'potential' from which selections are made when it comes to context of situation is the context of culture.

The 'context of situation', the immediate relevant social context of the linguistic interaction, thus stands in an instantial relation to the 'context of culture' (see e.g. Hasan, 1999:223), the interrelation of semiotic systems that comprises the social system (Halliday & Hasan, 1985:4). In this relation, "each situation is an instantiation of (some choice path from) the system of culture" (Hasan, 1999:258–259). The context of culture is thus seen as the 'potential' for a community's social interactions, and "specific contextual configurations themselves derive their significance ultimately from their relation to the culture to which they belong" (Halliday & Hasan, 1985:99).

But even if we recognise that there is a potential (i.e. the context of culture) which contexts of situation instantiate, to what extent can this process of instantiation be considered one of 'choosing', in terms of interactants making a selection (albeit unconscious) from the context of culture? Here the analogy with the lexicogrammatical and semantic strata begins to deteriorate, as I hinted earlier.

A further challenge arises when the diachronic dimension is brought into consideration. Language is a dynamic, changing system (e.g. Hasan, 2004), and it is no simple matter to work out what options are *in absentia* (available in the system but not taken up in the instance) when the existing descriptions are based on instantiations of a system that is in effect different from the one being investigated. It is also difficult when one is not 'acculturated' into the original contextual or semiotic paradigm (cf. Hasan, 1996a). This is the case when the object of investigation comes from a context distant from the analyst – distant by geography, historical period, worldview, etc. (cf. Bartlett, this volume; Halliday, 1959; Hasan, 1996a) – and it can be especially difficult to apprehend the range of potentially relevant contextual features. Thus, in a diachronic analysis, we need a principled way of understanding and circumscribing the 'available' options at the relevant point in time in order to understand and meaningfully interpret the semiotic choices and contextual settings. The SFL framework has the potential to manage diachronic change in language and its context, recognising that the unfolding of instances of communication (logogenesis) occurs simultaneously alongside a greater unfolding of the linguistic culture of a community (phylogenesis) and the unfolding of individual communicative experience (ontogenesis) (cf. Halliday & Matthiessen, 2004:47). But the relationship between these semiotic 'unfoldings' and the notion of choice in context is yet to be operationalised in a way that would benefit such analyses (see Scott, 2009, for a preliminary discussion).

The literature on parameters of context has not shied away from invoking the concept of 'choice' in relation to context. For example, in 'Speaking with Reference to Context' (1999), Hasan writes:

> What **choices** are made in field is relevant to some extent to the **choices** in tenor and in mode. (Hasan, 1999:244)

> the **choices** in one parameter do not 'determine' or fully 'predict' all the **choices** in the remaining two, otherwise we would not have needed to recognise three separate parameters. (Hasan, 1999:245)

> the echoes of a **choice** in one [parameter] are found to some extent in the **choices** of the others. (Hasan, 1999:245)

> the genesis of tone setting is not so much in what is being done but in who is doing it: it arises from some features of the tenor **choices** in the main context, and is typically relation based. (Hasan, 1999:255)

From these quotations it would appear that a principle of 'choice' at the contextual stratum is significant in a number of ways. First, it is implicated in the conceptualisation of the relationship between each of the parameters of context (field, tenor, mode), and also of the relationship between these parameters of context and semantic domains or metafunctions. Second, and

in a related way, it has significance for the interpretation of semantic choices. Hasan's description (above) of tone setting as a semantic feature motivated by some particular 'choice' in the tenor of discourse exemplifies the way an understanding of 'choice' at the contextual stratum can help the analyst make sense of the relationship between contextual and semantic features in a given instance.

In the same paper, Hasan also recognises the potential for subtle differences between the organisation of the linguistic (lexicogrammatical and semantic) and extralinguistic (contextual) strata, "which would not be entirely surprising: after all, context may be (partly) construed by language, but it can never be dissociated from the material and institutional aspects of a culture" (Hasan, 1999:245). As an example of the differences in the organisation of strata, she refers to the principle of "conditional probability" (Hasan, 1999:246), where a choice at one point in the system increases the likelihood of a particular choice somewhere else in the same stratum. At the level of lexicogrammar, conditional probability would usually mean that a selection within a particular system would increase the likelihood of certain other selections from within the same general system (i.e. realising meanings in the same metafunction). For example, Halliday and Matthiessen (2004:133) suggest that the selection of a Vocative is more frequent with 'demanding' clauses (interrogative or imperative mood) than with 'giving' clauses (declarative mood). These are all choices from the MOOD system in English, realising interpersonal meanings. But at the contextual stratum, "conditional probability is more likely to implicate features *across* the systems of field, tenor and mode" (Hasan, 1999:246). For instance, where the social activity is quotidian in nature (a 'choice' in field), the probability of a dialogic context increases (a 'choice' in mode). This principle of conditional probability underpins the concept of register, where we find predictable configurations of semantic options motivated by configurations of contextual features (Halliday, 1978b).

14.3 Context as system

In many of their publications (e.g. Halliday & Hasan, 1985, 1985b; Hasan 1995, 1999), Halliday and Hasan describe context at a primary degree of delicacy within the parameters of field (the nature of the social activity taking place), tenor (the nature of the social relationships enacted in the context) and mode (the part language is playing in the context). Delicacy here refers to "the degree of detail, or specificity, to which the description is taken" (Halliday & Matthiessen, 1999:325; see also Halliday, this volume). The parameters of the relevant context 'activate' or 'motivate' the uptake of particular semantic and grammatical choices, and simultaneously we can take the grammatical selections in the text as evidence of the "motivational relevancies" in the context

Table 14.1. *Description of context according to field, tenor and mode at a primary degree of delicacy (based on Hasan, 1999:233)*

FIELD OF DISCOURSE	Providing selected, structured information and perspectives about recent world events: updating previous instalments: reporting the end of a war . . . Agentive relation: newspaper/journalist addressing newspaper reader: virtual addressee: adult; educated; interested in current world events . . .
TENOR OF DISCOURSE	Social relation: institutionalised; peer: writer/newspaper dependent on reader's loyalty to maintain readership and maintain advertisers' patronage; reader dependent on writer's service for most recent and comprehensive information about inaccessible events (cf. Stephens, 2007) Social distance: near maximal . . .
MODE OF DISCOURSE	Role of language: constitutive . . . Channel: graphic; no visual contact; monologic: no process sharing . . . Medium: written . . .

(Hasan, 1999). At a primary degree of delicacy it may be possible to identify a common contextual configuration for texts where there are actually significant contextual differences. Table 14.1 shows such a description for a set of seven *Sydney Morning Herald* news reports about the conclusions of wars, spanning a period from 1902 to 2003 (see Section 14.4 below). As topically consistent news reports from the same newspaper, we might call them instances of the same register, as we can predict the kind of semantic domains that would be 'at risk' for these texts (Halliday, 1978b:185).

The contextual description provided above may be adequate for general purposes, but in order to identify the extent of variation in the register over time, a more delicate description is required. As might be expected for a corpus of this historical range, there are some significant differences in context, which would need to be identified at further degrees of delicacy. The contextual parameters of field, tenor and mode have been further developed into system networks by Hasan (e.g. 1995, 1999). More recently, Butt (2004) has proposed further, more delicate distinctions between contexts based on Hasan's networks (see also networks for field in Bowcher, this volume). The networks collectively constitute a putative "map of the meaning potential" (Butt, 2004:7) at the level of context. Butt's motivation for developing the networks in this way is that "every context needs to be described so that the unique relations pertaining to that context emerge; at the same time as the uniqueness is established, the corollary must also be made available – what the text shares with others in the register" (Butt, 2004:7).

14.4 Context in the instance

The following sections of this chapter will consider the issue of choice in context by presenting some findings of a diachronic study of news reports of the conclusions of wars from 1902 to 2003. The larger study on which this is based gives an account of broader meaning change (and consequently social change) simultaneously with the description of more delicate semiotic choices and register variation (see Scott, 2008a, 2008b, 2009, 2010, 2011). Thus, the perspective on 'choice' here is one in relation to the concept of register. Register is defined in this chapter, following Halliday, as "a setting of probabilities in the semantics" (Thibault, 1987:610) and "a functionally motivated sub-system within the language" (Halliday, this volume). It is a pattern of instantiation of meaning potential in a probabilistic relation with a particular context of situation (Halliday & Matthiessen, 2004:27–28), being realised in the lexicogrammar and activated by the configuration of variables in the context of situation (field, tenor and mode) (see also Halliday, 1985:38). As with the system, register can be defined probabilistically with reference to a corpus of instances of texts from a particular situation type (see Teich, this volume); as with the instance (e.g. individual texts), it instantiates the full potential of the language system, although to a more generalised degree. The use of a set of historical instantiations of a register of news reports in this chapter highlights some analytical imperatives for having a more fully developed model of choice in context – imperatives that might be overlooked in synchronic register studies.

The texts investigated in this study were reports of the ends of seven overseas wars in which Australian military personnel were involved: the Boer War (1899–1902), World War I (1914–1918), World War II (1939–1945), the Korean War (1950–1953), the Vietnam War (1962–1975), the Gulf War (1990–1991) and the Iraq War (2003[1]). The fact that each text was published in the *Herald* indicates that, at the time, they were all offered as texts fulfilling the function of 'news report' for that day. So the considerable variation that becomes evident as the texts are compared needs to be understood against the ground of that common social function. For example, each text was presented in the newspaper on the first day on which the end of the war was reported, and in the foremost position for important news in that issue of the newspaper. Thus, their symbolic presentation indicates that, as far as the *Herald* was concerned, these texts all constituted 'breaking news' in relation to the developments in the unfolding of the various wars. They each fulfil a broadly similar function within a broadly similar context of situation (see Table 14.1).

[1] While the conflict in Iraq did not end in 2003, the 'fall of Baghdad' (10 April, 2003) was construed and considered by many as the end of a significant phase of the conflict.

14.4.1 Choice or imperative? Discerning the value of a feature

Hasan has argued that "*the concept of context must include all those features of the interactants' material and social conditions of existence which are necessary and sufficient for the explication of what is said, whether directly or by implication*" (Hasan, 1999:238, italics original). This suggests that even coming to a text many years after its initial production, we should be able to sufficiently infer the relevant context from the text itself, since "language has the potential for construing context . . . irrespective of whether the moment of the text's production and its reception by the addressee are the same or not" (1999:238). The implication is that whatever is not construed by the text itself is therefore not necessary for properly understanding the text. Not all aspects of the material context are always realised in the text, and so not all aspects of the material context are always relevant to the text as social process (cf. Cloran, 1999, on 'material situational setting'). But it is not always possible to infer the context from the text alone, at least not with complete accuracy (see Berry, this volume, for implications of this for language users). It is necessary sometimes to reach beyond the text – in this case, to view the whole newspaper, and to research the historical and institutional context of the text (see Bartlett, this volume, for examples of texts whose meaning relies on appropriate cultural understanding). How to do this productively without "transcribing infinity" (Cook, 1990) remains a question that will be answered differently for every study. But it is important to realise the necessity of appealing to the contextual stratum in linguistic studies in order to establish the 'ground' of changing relevancies.

Over the period of time covered in the study of the *Herald* texts, there were many changes in the technologies involved in press news production, including communication technologies, sound recording devices (e.g. for recording brief interviews 'on location' which could then be transcribed and published), photographic reproduction techniques, and machines used for typesetting and printing the newspapers. The analytical relevance of broader socio-historical factors such as technological development should not be underestimated, particularly in a comparative study. Such factors have the potential to alter the paradigm from which the options are selected in meaning-making, and therefore must be understood if the value of the options selected is to be accurately interpreted. It is a question of *valeur*, since the meaning of the text in its context is relative to the meanings of texts from the same paradigm. Two examples offered below demonstrate instances where, without a way of accommodating diachronic variation in the contextual system, the value of a contextual feature might be misinterpreted.

First, I have said that each of the texts fulfilled an equivalent role in the newspaper of each time, so modern readers might be surprised to learn that not all of them appeared on the front page of the *Herald*. The Boer War and

WWI texts were found on page seven of their respective issues. If we were to interpret this from our current understanding of the context of a newspaper, we might conclude that the news of the end of the Boer War and WWI was considered less important than other news. But this was not the case: it may be explained by the fact that, during the Boer War and WWI (and indeed up until 1944), the front page was devoted to the commercial function of the newspaper (see e.g. Souter, 1981) – primarily advertising and shipping news. The war news then took its regular place on pages seven and eight, following classified advertising, local news and weather. In April 1944 (i.e. towards the end of WWII), driven by both editorial and economical concerns, a significant change in the organisation and layout of the *Herald*'s editorial content was made so that the news could appear on the front page of the paper, and advertising then became dispersed throughout the paper (Souter, 1981).

The important point arising from this, in relation to the notion of 'choice' and context, is that at different times, a system of context may have different available options, and so the instantiated feature may have a different value in relation to the system. In the case of the Boer War and WWI texts, placing the report of the end of war on page seven was an imperative rather than a choice, as the option of putting news on the front page was not available for the newspaper at that time. Although in practical terms it was certainly possible to place news on the front page, it was not a "socially recognisable" practice (see Hasan, 2009c:169), so it did not enter into the context of culture.

As a second example, the reports of the end of the Boer War and WWI both appear on a page with text only and no pictures. A modern reader accustomed to photographic accompaniment of news accounts might initially suppose that the technology for producing and publishing pictures was not yet available because if it were the newspaper producers would surely have used it. However, further investigation reveals that other pages in the same newspapers do feature pictures (usually pictures kept on file, such as maps or portraits of public figures), so the inclusion of pictures was possible, both in terms of being technologically feasible and "socially recognisable" (Hasan, 2009c:169). We can see, then, that without having an understanding of the contextual resource base, it would be possible to misconstrue the absence of pictures as an imperative rather than a choice. Until some decades after WWI, the publication of photographic records of events in the *Herald* was still unusual enough to warrant a special page or section of the newspaper to display a large number of photographs at once, e.g. a pictorial section was included in the newspaper to commemorate the Federation celebrations that took place on 1 January 1901.

The *Herald* centenary history publication in 1931 commented that, although pictures came to be used more regularly around WWI, "there seems generally to have existed till about that time an idea on the part of editors and proprietors of great dailies that it was lowering to the dignity of such journals to publish

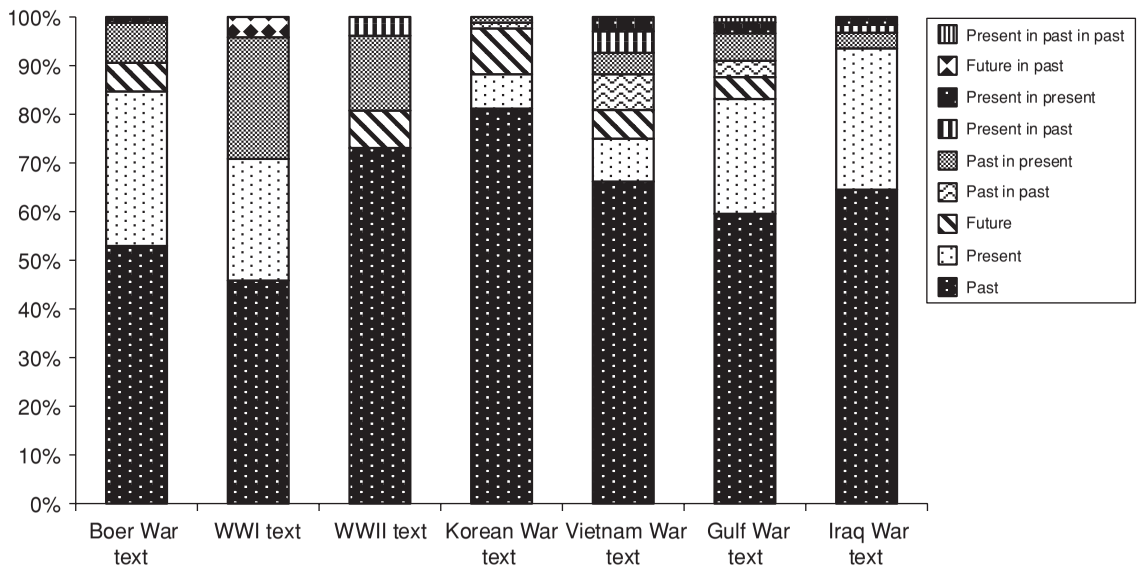

Figure 14.1. Primary and secondary tense selection in free indicative temporal clauses

illustrations as part of the daily news" (John Fairfax & Sons, 1931:737). This would suggest that the use or omission of pictures was not so much determined by the state of the technology, rather it was a contextual setting of mode harnessed for the service of a particular tenor relation that the *Herald* as an institution was aiming for. In today's *Herald*, the opposite is true – it seems to be virtually an imperative to have pictures on every page, and an absence of pictures would almost certainly be cause for comment among readers. For modern readers, photographs do a great deal of work in telling the news stories to the extent that they are able to carry some of the burden of explanation, description and connotation that the linguistic resources were required to carry alone in earlier times.

14.4.2 Exploring contextual consistency and change

In this section I will describe the patterning of a lexicogrammatical feature (tense) in the texts and follow this with a description of features of the context of situation.[2] The analysis and discussion will demonstrate how lexicogrammatical patterning, and its semantic implications, can illuminate contextual 'choices'. It will also highlight the importance of controlling systemically for contextual features to enable proper evaluation of the value of linguistic choices. The tense analysis has been presented before in a paper investigating register change with a focus on the tenor of discourse (Scott, 2011), but I will briefly rehearse the details here to allow re-evaluation of the findings in the light of the particular question of choice in context. The feature of tense has been selected because, while there are certain similarities in patterns across the corpus that might be expected from their registerial identity, there are also some intriguing differences which seem to highlight registerial differences and which beg contextual explanation.

At least 70 per cent of the free indicative temporal clauses (i.e. not including non-finite clauses, non-indicative clauses, or clauses with a modal finite) across all texts select primary tense only. This means that in all texts, tense is primarily either simple past (e.g. *all the Boer delegates arrived at Pretoria on Saturday*), present (e.g. *Observers consider General Choi's presence as evidence that South Korea will collaborate in the armistice*) or future (e.g. *An Australian Army unit will enter Japan with General MacArthur's forces*). The most frequent tense selection overall is past tense, as shown in Figure 14.1, which presents the frequencies of different types of primary and secondary tense selections for all texts as a proportion of the free indicative temporal clauses. The predominance of past tense in all texts indicates, unsurprisingly,

[2] There is insufficient space here to present full contextual analysis using system networks, but the analysis has been done for all texts and can be examined in Scott (2009: Chapter 7).

that one of their main functions as news reports is to make known events that occurred in the past. A lesser degree of importance is placed on construing current events (i.e. in present tense), and even less still on construing predictions for the future. Figure 14.1 also shows that, from the WWII text onwards, there is a generally higher proportion of use of past tense (≥60% as opposed to around 50% or less in the earlier texts).

Another finding shown in Figure 14.1 is that the first three texts (Boer War, WWI, WWII) select past-in-present tense more frequently than the later texts. Upon investigation of this phenomenon, it was discovered that the later texts used past-in-present tense only (if at all) in projected speech (direct or indirect), whereas the earlier three texts used it in both projected and non-projected material, e.g. *The terms of peace have been signed at Pretoria*. (Boer War text) vs. *Troops moved through the street with loud hailers declaring: "The forces of the National Liberation Front have become masters of Saigon . . . "* (Vietnam War text) and *The United States military declared yesterday that Saddam Hussein's rule over Baghdad had ended* (Iraq War text) (see Scott, 2011, for further examples and discussion).

The main semantic consequence of tense selection here is a fragmentation or unification of temporal perspective, from dispersed temporal perspectives in the earlier three texts, to a more unified temporal perspective in each of the later texts. The change seems to correlate with technological and other social developments (see Section 14.4.5 below) in a way that suggests it is more than just instantial aberration. The value of the shift in tense selection must be understood against the shifting contextual ground. It is not that the selections necessarily reflect more or less immediate experience of the events reported; rather, they reflect different 'choices' in the context of news reporting. There seem to be contextual pressures in field, tenor and mode that motivate the choice of tense, and these pressures will be the focus of the following sections.

14.4.3 Field

In terms of field, I suggest that the goal orientation and epistemological status of news may have had an impact on the extent to which it was contextually acceptable to recontextualise news material into a single, unified temporal perspective. The earlier texts (Boer War and WWI) are constructed from telegraphic news bulletins ('corantos') sent on different days and not necessarily arranged chronologically (see Extract (1)). Thus indication of the temporal deixis of the time of writing in these texts is important for readers' interpretation of the sequence of events between individual corantos. Therefore the past-in-present selections combine with the dateline to specify from which temporal perspective the event was in the past. For example, in Extract (2), the

meaning is 'the invaliding to England of Colonel de Lisle was in the past but still unresolved from the point of view of the person writing this telegram on 1 June'. Therefore, the *Herald* maintains the temporal perspective of the original telegraphic communication by using past-in-present tense. The later texts would tend to shift the clause into the simple past, e.g. the clause in Extract (2) would become 'Colonel de Lisle was invalided to England (last week)', in order to unify the various pieces of information under one temporal perspective.

Extract (1) The first 'corantos' from the Boer War text published on 3 June 1902

> THE FIRST ANNOUNCEMENT.
>
> LONDON, June 1.
>
> The terms of peace have been signed at Pretoria.
>
> June 2.
>
> After signifying their acceptance of the British terms all the Boer delegates arrived at Pretoria on Saturday and signed at half-past 10 o'clock at night the document containing the terms of surrender.
>
> Lord Kitchener, in his despatch to the Imperial Government, added that Lord Milner and himself had also signed the document.
>
> THE VEREENIGING CONFERENCE.
>
> LONDON, June 2.
>
> The conference of Boer delegates representing the commandoes in the field was unanimous in the decision it came to on Saturday.
>
> The principal Boer leaders accompanied the delegates to Pretoria.
>
> The "Express" states that the knot of irreconcilables were told at the conference at Vereeniging that they would have to fight alone if they persisted in their attitude, and it was only then that they yielded.

Extract (2) 'Coranto' from the Boer War text showing past-in-present tense

> LONDON, June 1. Colonel De Lisle, who was for a long period in command of New South Wales troops, has been invalided to England.

The analysis of tense selection described in Section 14.4.2 shows that the temporal perspective in the Boer War and WWI texts was dispersed, suggesting that the original form of the corantos, which were written at different times by potentially different writers in different places, was largely retained. A contrasting example from the later texts is the Iraq War text, which gives a much more unified temporal perspective. The Iraq War text is unique in being presented largely as an eyewitness report based on the experiences of the journalist Paul McGeough (see also McGeough's (2003) book recounting his

time in Baghdad). References to Reuters and the Press Association at the end of the report and the use of quotes from both civilians and military officials show that the text still engages in the recontextualisation of words that were originally part of a different text and context. But it integrates them under a unified perspective, that of McGeough, and turns the various perspectives on the experience in Baghdad into a more narrative-like form than the earlier, telegraphic texts.

These same 'choices' in the field (as well as some of the historico-political aspects of the wars themselves) have also been shown to have influenced the degree of temporal specificity in the texts as realised linguistically by Circumstances of time (see Scott, 2008b). The earlier texts tended to be quite precise about time, with their separate datelines and compartmentalisation of information under sub-headings, and thus gave the reader the opportunity at least to work backwards from the datelines to decode the sequence of events. The more recent texts tended to create more dramatic, engaging descriptions, but in so doing reduced the likelihood that readers would easily be able to gain a clear understanding of the sequence of events. So while at a broad degree of delicacy the texts are all concerned with the same activity of reporting, being able to describe the context more delicately and understand the features against a ground of systemic options gives us a way of explaining different patternings of linguistic choices.

14.4.4 Tenor

The findings presented in Section 14.4.3 begin to encroach on the descriptive territory of tenor in that they suggest a change in the role of the journalist: an increase in visibility as a social agent, and a shift to a 'narrator' role. As shown in the contextual description in Table 14.1, the tenor of the news reporting context (at a broad degree of delicacy) is an institutionalised one in which the journalist is a giver of information and there is near maximal social distance between the journalist and the reader. A significant semantic indicator of social distance is the extent to which the writer is 'visible' in a text, which in most cases is most clearly realised by the textual identification of interactants. In a newspaper report, the option of specifically identifying the reader is not available, but the option of identifying the writer or institutional source of the text or information is. When the writer is identified in a news report (e.g. using a byline), the text is somewhat individualised, and an explicit signal is being given as to the institutional role or connections of the writer.

Table 14.2 shows how (if at all) each text identifies the writer or agency responsible for the report. Interestingly, specific journalist bylines only appear on the Gulf War and Iraq War texts. There seems to have been a shift from absent to explicit identification of the writer in the *Herald* over the period

Table 14.2. *Identification of writer or agency in the texts*

Text	Identification of writer
Boer War text	None
WWI text	None
WWII text	None
Korean War text	Agency location only: New York, 27 July (A. A. P)
Vietnam War text	Agency location only: Saigon, Wednesday
Gulf War text	Journalists: Tony Walker in Riyadh and Peter Stephens in Washington
Iraq War text	Journalists: Paul McGeough and Sean Maguire in Baghdad Agency: Reuters, Press Association

1902–2003. Investigating the institutional history reveals that the *Herald* generally preferred to leave writers anonymous (except in special correspondent reports) until 1942, when there was a change in policy allowing the use of bylines (Souter, 1981:208). The former 'no bylines' policy has been described as an 'anomaly' among other newspapers at the time, and when the *Herald*'s war correspondent in the Middle East, G. E. W. Harriott, complained about not being explicitly identified in his reports, the editor's response indicated that the institution did not wish to prioritise the individual identity of journalists over the appearance of a cohesive institutional identity (see 1981:207–208).

The shift in explicit personal identification of the journalist seems to coincide with a change in the agentive role of the journalist as the creator of an original piece of writing in the later texts. This seems to have warranted the integration and unification of information into the temporal perspective of the journalist (cf. Matheson, 2000, who argues that, before the 1930s, journalists were restricted from recontextualising or reinterpreting news information), and hence the shift to the predominant use of simple past tense.

14.4.5 Mode

In terms of mode, there are obvious similarities in that all are written, printed texts. However, technological capabilities changed in a way that enabled not only faster information transmission from sources to journalist and thence to editors (i.e. potentially increasing time available for collating and editing the source information), but also more flexibility in the production processes (i.e. word processors allow extensive editing of written material, and desktop publishing programs allow page layout changes to be made up to the last moments before going to press).

During the Boer War, at the turn of the twentieth century, the typesetting and printing process for the *Herald* was very laborious. News copy was typeset using Monoline typesetting machines, and printed using Bullock rotary presses (John Fairfax & Sons, 1931:724, 726). Typesetters used the Monoline machines to mechanically select and arrange the characters or types (brass character moulds), which were stored in a magazine connected to a keyboard on the machine. At a keystroke, the required character would be released from the magazine into the line of type, and the lines of type were then mechanically cast from hot metal (1931:726). In order to be printed, each line of type was arranged and secured in its place within a frame the size of the finished newspaper page, and a cast of the page was made using *papier-mâché*. The *papier-mâché* mould was used to cast a curved metal forme of the page, which was fitted onto a press cylinder. The Bullock presses were made up of units of two printing cylinders, each covered with the metal formes of pages. Paper from a roll was fed between the two cylinders so both sides could be printed simultaneously (1931:724). The same principles from this stage of development of the technology are used in today's presses, albeit using different methods.

This laborious process of typesetting in the early years of the twentieth century must have limited the range of possible options in the preliminary stages of production involving journalists and sub-editors, and must thereby have influenced the end product. For example, it would have meant there was little time for rearranging and recontextualising the information, which are semantic consequences realised by lower cohesion (see the corantos represented in Extracts (1) and (2); see also Scott, 2009: Chapter 6, and 2010, for an analysis of cohesive harmony) and a greater variety of tense selections (as discussed in Section 14.4.2).

This discussion of context from a diachronic perspective shows that, while the contextual settings at primary degrees of delicacy are common across texts instantiating the same register, more delicate settings of context may illuminate instantial nuances and even diachronic shift or consistency (e.g. here, the use of past-in-present tense for only projected clauses in the Vietnam, Gulf and Iraq War texts) (cf. Hasan, 1985a). Another thing that is clear from this discussion of lexicogrammatical patterns and contextual features is that single features of the context cannot always (indeed, probably rarely) be pinpointed as the sole motivation for particular lexicogrammatical choices (see Bartlett, this volume, and Bowcher, this volume, for further discussions of the 'context-metafunction hook-up hypothesis'). Rather, contextual features at varying degrees of delicacy need to be considered as configurations motivating the uptake of lexicogrammatical or semantic options. The relationships between the contextual pressures and their semantic and lexicogrammatical realisations in terms of tense in these texts are summarised in Figure 14.2.

	Earlier Texts (Boer War, WWI)	Later texts (Vietnam War, Gulf War, Iraq War)
Context	field: collation of information from various sources	field: creation of an original piece of writing using information from various sources
	tenor: invisible journalist, unwarranted to alter form of information	tenor: visible, individualised journalist
	mode: laborious and relatively inflexible technology with respect to potential for late adjustments	mode: labour-saving and flexible technology with respect to potential for late adjustments
Semantics	maintenance of temporal perspective with respect to past events	integration of information from sources into the temporal perspective of the journalist or agency
Lexicogrammar	use of past-in-present tense for reporting past events	use of simple past tense for reporting past events

Figure 14.2. Examples of realisational relationships between features

14.5 Concluding remarks

The discussion above has a number of implications for the study of context. First, it highlights the need for further modelling of context at greater degrees of delicacy in order for the more specific differences between contexts to be made explicit. Although there is overall contextual consistency in selections at the least delicate end of the contextual paradigm, variation starts to emerge at the more delicate options for each parameter (see Scott, 2009: Chapter 7). According to Hasan, this is how we can account for variation within a register (Halliday & Hasan, 1985:115). The same selections at the more general end of the system lead to structural consistency, whilst slight variations at higher degrees of delicacy result in textural variation, which does not necessarily affect the integrity of the register (Halliday & Hasan, 1985:62; see also Scott, 2010, 2011).

Second, it demonstrates the need for a mechanism that can accommodate diachronic change in systems (not just in context), taking into account the different analytical needs of diachronic and synchronic linguistics (cf. Saussure, 1959). It is difficult to interpret the contextual paradigm and thereby evaluate the values of linguistic choices when the explicitness of cultural *valeur* is low and the semiotic distance between context of production and context of reception is great. Hasan (1996a:44) has pointed out that "cultural distance has a diachronic dimension as well as a synchronic one – the ways of being, saying, feeling, and doing in a community differ over time". The potential for cultural distance even within the 'same' community requires us to recognise the possibility of disjunction between the context of production and the context of reception (1996a:45). The principle of cultural distance between contexts of production and reception is illustrated in Figure 14.3. The diagram represents the relationship between the proximity of the contexts of production and

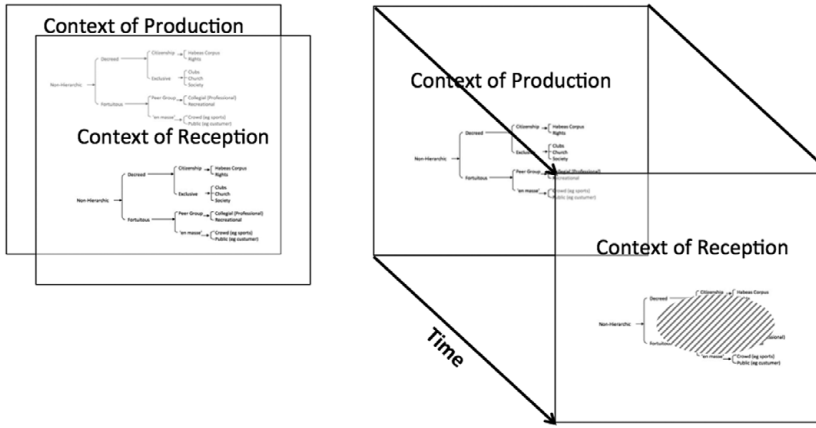

Figure 14.3. Semiotic distance between temporally distant context of production and context of reception

reception and ease of contextual interpretation. When the context of production and context of reception occur close together (either temporally or culturally) as on the left-hand side of the diagram, there is likely to be minimal difficulty of interpreting context of situation (represented iconically by a section of a context system network) because the semiotic distance is small. When the context of production and the context of reception occur far apart (either temporally or culturally) as on the right-hand side of the diagram, there is a greater possibility of interpretative difficulties. The system of context operating at the time of production may be made unclear for readers in a temporally distant context of reception because of changes in the system in the intervening time.

Third, it emphasises the need for analyses of more instances and their 'significant properties' at all strata in order to develop a more comprehensive and robust model of systems at all strata. Continuing clarification of the systemic values of context would greatly benefit linguistic research and increase the confidence and ability of linguists to control for contextual variables to evaluate the values of linguistic choices, particularly in register studies, where the analysis is focused on a mid-point of the cline of instantiation.

I will conclude with a lengthy but important quotation from Hasan:

> Context is pivotal to the study of both kinds of variation [semogenesis and dialectal or diatypic variation]: it is the locus of variant occurrences, and speakers are located by reference to context within their social world. At the same time, being an instance of culture, it carries the potential of tracing the work that varieties of a language do in the maintenance and change of cultural patterns of life. The pay off for the integration of

context thus allows an opening into the valuable field of sociology of language as [a] natural step in the theory. (Hasan, 2009c:171)

Far from being an 'extra' to the core concerns of linguistics, context and its integration into linguistic theory are essential for linguists who aim to contribute productively to explanations of language in social life.

15 Material action as choice in field

Wendy L. Bowcher

15.1 Introduction

Context is of particular significance in the analysis of language across a range of approaches and theories but, as yet, there is little in the way of a theoretically motivated set of contextual choices that an analyst may turn to to guide their interpretation of language in use. While Firth (1968:177) raised the issue of 'relevancy' in his description of context, it was Halliday who proposed that the features of context could be categorised along three semiotic parameters: 'field', 'tenor'[1] and 'mode'. He posited that these features "activate corresponding portions of the semantic system, in this way determining the register, the configuration of potential meanings that is typically associated with this situation type, and becomes actualised in the text that is engendered by it" (1978b:117).[2] Since early in the development of Systemic Functional Linguistic (SFL) theory, the contextual parameters of field, tenor and mode have been seen as points of entry to a "set of possibilities . . . or options" (Hasan, 1985c:55). However, Hasan (2009c:179) argues that the conceptual construct of context of situation as it now stands is too vague and suffers from "the absence of 'checkable' criteria" with analyses relying instead on "common sense". Further, she contends that there is "no reasoned framework to work with" and that "SFL linguists have largely been doing what any ordinary speaker of the language would do, i.e., construing from the language of the text what the text is all about" (2009c:180).

This is a serious criticism and one that should not be ignored. There have been few serious attempts to develop the concept of context in SFL and to model context (e.g. Butt, 2004; Hasan, 1999, 2009c; Leckie-Tarry, 1995; Martin, 1992; O'Donnell, 1999). This has raised criticism of context in SFL from those working within other theoretical paradigms. Biber (1994:34), for instance, argues that register analysis cannot be done by using "open-ended parameters"

[1] Halliday originally used the term 'style'. Michael Gregory introduced the term 'Tenor', arguing that tenor was a more "unambiguous term" and had "some of the advantages of neutrality" (1967:195).

[2] The 'determining' relation has since been clarified as a dialectic relation.

such as field, tenor and mode because these "have an undetermined set of possible values, [which] do not allow a precise characterization of individual registers". Van Dijk (2008:39), too, bemoans the lack of self-criticism and theoretical development of the concept of context in SFL, and is critical of the "lack of precise definitions of the three contextual categories". Such criticisms are somewhat justifiable in that a more precise and objective specification of the sets of semiotic choices in field, tenor and mode have rarely been at the forefront of research pursuits in SFL. Those rare attempts have primarily relied on the system network as a mode of representation (see, for instance, Cloran, 1987; Hasan, 1999, 2009c; Martin, 1992); with the most comprehensive set of system networks developed by Butt (2004).

In SFL theory, "the system network is the central motif" setting out a potential set of features possible at a particular stratum "organised in relation to each other in terms of 'system networks' of choices or options" (Kappagoda, 2009:11). For context, this means a potential set of features from which a select few become relevant in a specific situation of language use. System networks provide a means of developing selection expressions for constructing or generating syntagms and at the same time a way of mapping paradigmatic choices relevant to a specific system. As such they can also be used to represent agnation (Matthiessen *et al*., 2010:212). Systematising the "realization-activating contextual features" (Hasan, 2009c:181) is an important step in developing a comprehensive set of "tools for tracking the enormous numbers of interdependent systems of choice" (Butt, 2004:5) across all strata of language. But developing these networks is easier said than done. They need to be worked with and tested so that the motivating features specific to one situation of language use can be more usefully described, then compared and contrasted with those of other situations of language use (cf. Scott, 2011, and Urbach, this volume). Such endeavours can shed light on the way in which contextual choices "align" with the "socio-material order and specifics of meaning" (Butt, 2004:6). But also, critically working with system networks is necessary for understanding and ascertaining their viability as a theoretical model of representing context, an issue that is itself under debate in SFL circles (see Matthiessen, 2011; cf. Bateman, 2008, who discusses issues in generation and analysis using system networks).

This chapter focuses on the system of MATERIAL ACTION within the parameter of field. Field has to do with the 'nature of the activity' in which language is playing a role, and this implies that there may be 'other factors' involved in construing the activity. I have chosen the material action network because its inclusion as a system of choices in the field network is under some debate. It is included in the field networks presented by Hasan (1999) and Butt (2004), but not by Hasan (2009c). This current lack of agreement suggests that material action has a particular theoretical significance in the development of

a 'reasoned framework' of the potential contextual choices, and particularly those for field. This chapter considers this issue and explores the place of material action as a choice in field. An adjunct consequence of the discussion is that it provides a snapshot of the nature of the task involved in developing and critically working with context system networks; the enormity of which cannot be overstated.

15.2 Context of situation and the CMH hypothesis

The major difference between the concept of 'context', or more precisely, 'context of situation', in SFL theory and that in other linguistic theories is its incorporation into the theory in a principled way, tying it in to the grammar and semantics of language. In SFL, language is viewed as a stratified system with the level of meaning (semantics) organised around a set of primary functions or 'metafunctions': experiential, interpersonal and textual. These construe and are activated by features of context of situation in a systematic, non-random, probabilistic way. That is, experiential meanings are those to do with the kind of experience being conveyed: the participants, processes and the circumstances contingent on those, and these meanings play a primary role in construing features of the field of discourse, the nature of the activity and the subject matter. Interpersonal meanings are those to do with the type of roles the participants are performing in the activity – their statuses vis-à-vis one another and the kind of interaction that is taking place, and primarily construe features of the tenor of discourse, the nature of the participants in the situation. Textual meanings are those which give the language its properties as discourse: the organisation of experiential and interpersonal meanings into something that makes sense. These tend to construe features of the mode of discourse, the role that language is playing in the situation. This high probability of correlation between features of context and the linguistic metafunctions is known as the context-metafunction hook-up hypothesis (CMH hypothesis) (Hasan, 1995:223). The CMH hypothesis is a clearly articulated theoretical approach to exploring the relation between context and language, providing the principle upon which one can ascertain what 'counts' as relevant context. However, there is more to the relation between context of situation and language that needs to be considered in developing a framework that can account for the complexity of situations in which language plays a role.

A basic tenet of SFL theory is that language is viewed in terms of stratification. Phenomena at any stratum can be viewed from the stratum above, below or at the same level (around). At the level of context, however, there is no "clearly articulated set of abstractions by reference to which we may talk about the agnation of context of situation" and so we are largely left with

looking at the stratum of context from below "by examining those semantic units called texts" (Hasan, 1995:268). Nevertheless, this approach is valuable as texts are semantic units functioning in situations, and to identify commonalities and differences between texts and text types is useful in identifying context types (1995:268), and thus in gaining an insight into the system of potential features of context of situation. This approach would amount to validating the concept of context from 'around', i.e. from the stratum of context itself.

15.3 Field in context of situation

The description of a specific field of discourse is very much tied in with the role that language is playing in the situation. For instance, when Halliday (see Halliday *et al*., 1964:90ff.) put forward his ideas about the relationship between language, material action and contextual field he proposed three basic scenarios:

1. If the event is practically only expressed or carried out through language, then the description of field relates to the subject matter of the language because in such situations the language is operating to convey that subject matter.
2. If the event is almost entirely non-linguistic, and if the language is operating to get something done in relation to that event, then the description of field coincides with the description of the event.
3. If the non-linguistic action is not at all involved in the event in which the speakers are linguistically engaged then the description of the field is determined by the subject matter of the language used and not the material event itself.

Clearly, the last of these indicates that one may be engaged in some kind of non-linguistic activity which is entirely irrelevant to the language being used, such as when one is washing the dishes while talking about politics (Halliday *et al*., 1964:91). This observation also relates to Hasan's category of Material Situational Setting (MSS). She suggests that seeing two people together in a university quadrangle "gives one no ground for predicting what [their] specific frame of relevance might be at that moment" (Hasan, 1981:118). In such situations the MSS is not relevant to the talk: it is the language itself that provides the basis for the definition of field.

Field is thus viewed in terms of activity and/or subject matter. Activity, according to Halliday (2007b:111) is "a more general concept than that of subject matter" because the same subject matter may enter into different social activities. In line with this idea, Matthiessen proposes that socio-semiotic processes can be categorised as either first or second order field. Activity that falls under first order field is that of 'doing'. This is defined as "undertaking

Table 15.1. *Excerpt from 'Table 2 Determination of semantic features by elements of semiotic structures of situation' in Halliday (1978b:117; see also Halliday & Hasan, 1985:36)*

	Situational	Semantic	
Field	manipulation of objects	process type and participant	Ideational
	assistance of adult	structure	
	movable objects and fixtures	benefactive	
	movability of objects & their	type of relevant object	
	relation to fixtures	type of location and movement	
	recall of similar events	past time	
	evaluation	modulation	

some course of action, facilitated by – but typically not constituted in – language ['language in action']" (Matthiessen, 2009:31). The other categories of activity are 'semiotic' and are categorised as second order field. They include expounding, reporting, recreating, sharing, recommending, enabling and exploring (2009:31). These are language-constitutive activities.

The concept of second order field was introduced by Halliday to refer to the source of the semiotic (languaging) activity. He argues that

> in a game of football, the social action is the game itself, and any instructions or other verbal interaction among the players are **part of** this social action. In a discussion about a game of football, the social action is the discussion, and the verbal interaction among the participants is **the whole of** this social action. Here the game constitutes a second order of 'field', one that is brought into being by that of the first-order, the discussion, owing to its special nature as a type of social action that is itself defined by language. (Halliday, 1977b:201–202, emphasis in the original)

This quotation also points to the importance of material action in the description of field; for instance, here it plays a role in the identification of the social action as 'a game of football'.

Throughout the development of SFL theory, material action is implicated in the description of field. Take, for example, Halliday's discussion of the relationship between the semantic features of a text and the "elements of semiotic structures of situation" in Table 15.1 (an excerpt from Table 2 of Halliday, 1978b).

Here 'manipulation of objects' and 'assistance of adult' would be classified under material action and construed by both physical (material) activities and (in this case) also language. Extract (1) is an excerpt from which the table was developed:

Extract (1)

CHILD: Oh yes it will . . . I don't want to send the train on this floor . . . you want to send the train on the railway line . . . but it doesn't go very well on the chair. The train all round and round. (Halliday & Hasan, 1985:30)

According to Halliday, specific language choices such as *send*, *go*, and *round and round* construe the 'manipulation of objects' as these utterances include references to the manipulation. But in the transcript of the talk, Halliday includes an annotation of physical actions accompanying this talk so that the relationship between the talk and the material action can be better illuminated. The original 'annotated' transcript is provided as Extract (2).

Extract (2)

NIGEL: Oh yes it will . . . I don't want to send the train on this floor . . . you want to send the train on the railway line [runs train up plank to chair] . . . but it doesn't go very well on the chair [makes train go round in circles]. The train all round and round. (Halliday & Hasan, 1985:30)

Some important questions are raised by the football example and the 'annotation' of the father–child text: (i) To what extent can the language alone indicate the configuration of features of the relevant context of situation? (ii) To what extent do we need to make recourse to non-linguistic phenomena in understanding the nature of the activity in certain situations? (iii) What role does the relationship between the linguistic and non-linguistic construals of the nature of the activity play in developing a potential set of contextual choices and in developing a description of the context of situation of a specific instance? The next few sections address these questions.

15.4 Field system networks

At present there are three main field networks developed within the SFL model: Butt (2004), Hasan (1999) and Hasan (2009c). We first look at Butt (2004) and Hasan (1999), as these bear similarities with regard to their primary system networks.

In both Butt (2004) and Hasan (1999) there are four primary systems (see Figure 15.1). In Butt's system there are: SPHERE OF ACTION, MATERIAL ACTION, ACTION WITH SYMBOLS and GOAL ORIENTATION. Hasan's four systems are MATERIAL ACTION, VERBAL ACTION, SPHERE OF ACTION and ITERATION. Butt and Hasan differ with regard to five main features:

1. Butt uses terms and systems originally developed from Hasan's work in his own networks (he indicates these in capital letters in Butt, 2004, but this distinction is not made here). However, this does not necessarily mean

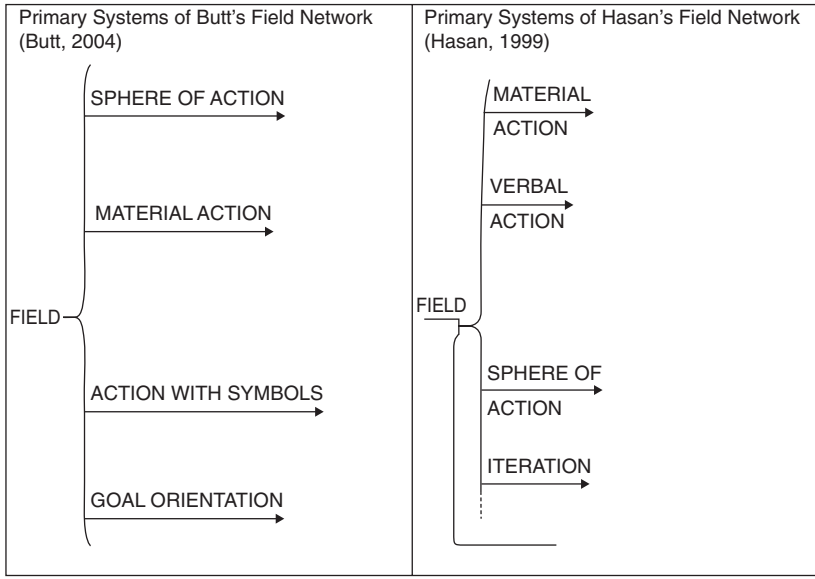

Figure 15.1. Primary field systems in Butt (2004) and Hasan (1999)

that the relative meanings and values of choices from Hasan's networks are the same as they are when located in Butt's networks (Butt, personal correspondence).

2. Hasan (1999) redefines field and mode and places the choices of ancillary and constitutive (which are often associated with mode) within field. The main choices available in mode are channel (phonic or graphic) and the physical contact between the speakers (Hasan, 1999:282). With regard to placing the choices of ancillary and constitutive under field, Hasan argues that "just like material actions, verbal actions . . . specify what the interactants are doing: in the verbal action of explaining, one of the interactants explains just as in the material action of buying, one of the interactants buys" (1999:282). This description of field (the nature of the activity) appears to be in accord with both Halliday's early descriptions (i.e. see especially Halliday *et al.*, 1964) and Matthiessen's categorisation of socio-semiotic processes as those of 'doing' or those of 'semioticising' (Matthiessen, 2009) (but not with Matthiessen's separation of first and second order activities as mentioned earlier).
3. In Butt's networks, the ROLE OF LANGUAGE (i.e. whether language is ancillary or constitutive) is a system within the parameter of mode. In his field network the choices of 'guiding (practical)' and 'telling (conceptual)'

would align with the mode choices of ancillary and constitutive respectively. The term 'alignment' can be explained in the following way: entry into each contextual system network (field, tenor and mode) is a simultaneous phenomenon.[3] Thus, the selection of certain choices within one system network constrains and is constrained by the selection of choices from other system networks. It is likely that when mature contextual system networks have been developed there will be default choices across the system networks for the contextual parameters.

4. Hasan positions ITERATION as a primary system in field, whereas Butt places a system with similar choices within his system of GOAL ORIENTATION.
5. Hasan includes default dependencies whereas Butt does not. Hasan argues that the inclusion of default dependencies is a way of accounting for the constraints on the combinations of relevant features of context of situation, with the implication that without constraints, the description would allow any combination of features, as though 'anything goes'. For instance, a choice of [material action: present] would not be possible with [verbal action: constitutive] in Hasan's network. Butt (personal correspondence), on the other hand, agrees that default dependencies may become salient as the networks mature, but sees a need at this point in their development to leave the networks open for possible and perhaps unexpected combinations.

Leaving aside these differences, we now turn to the common features of Butt's and Hasan's field system networks, and in particular, the network for material action.

15.5 Material Action in the Field Networks

Hasan's (1999) and Butt's (2004) networks include MATERIAL ACTION as a primary system, and at a basic level the term refers to those physical actions that play some role in the speech event. However, if we explore each network and the accompanying descriptions more closely, some interesting issues emerge.

15.5.1 Butt's definition of material action

The primary choices in Butt's MATERIAL ACTION network (see Figure 15.2) are [obligatory (core)], [oblique (marginal)] and [absent]. The choice of [absent] offers two possibilities: [irrelevant] or [deferred]. Irrelevant material action is

[3] 'Realisation' is a multiply orchestrated phenomenon; choices made within the system networks for context are simultaneous with choices in systems at other strata. That is, "all strata taken together construct meaning" (Butt, 2008b:68; Butt & Wegener, 2007:593).

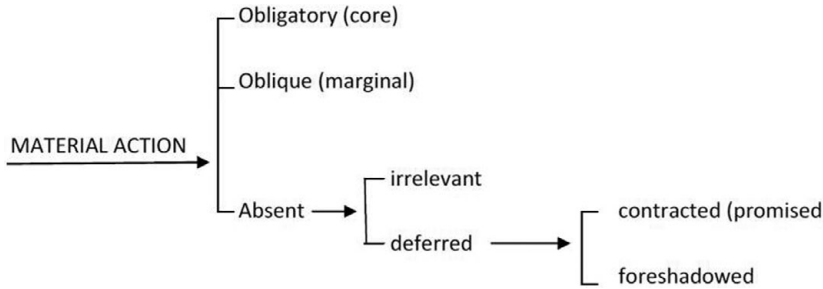

Figure 15.2. MATERIAL ACTION network in Butt's (2004) field network (permission to use this network kindly granted by David Butt)

non-linguistic action that does not enter the talk at all and is hence not a part of the description of context of situation. Deferred material action refers to those situations where "material action will take place in the future by agreement, by the very nature of the exchange" (Butt, 2004:28).

Butt's definition of [material action: obligatory] is "context cannot be plausibly conducted without some material action in the very 'goings-on' of the symbolic exchange" (2004:28), and this is similar to Hasan's concept of 'language ancillary' activities. An example of such an exchange might be a cooking demonstration. A recipe, on the other hand, would construe deferred material action. [Material action: oblique (marginal)] is defined as material action "which is not criterial/critical to the characterization of the social event", which is similar to Hasan's concept of 'language constitutive' activities. Such an event could be a lecture. A lecturer could choose to act out some information or perhaps obtain participation from members of the audience, rather than simply talking the whole time. Butt thus suggests a continuum of material action choices according to the role material action is playing in the situation vis-à-vis language.

Unlike Hasan's network, Butt's network does not have the primary system VERBAL ACTION. Rather, Butt suggests ACTION WITH SYMBOLS, thus seemingly acknowledging language as one type of 'semiotic activity' in communicative situations. However, the phrase 'with symbols' rather than 'symbolic action' seems to suggest that some kind of physical or material action is taking place that is not symbolic or semiotic in nature, and that this may be accompanied by something that is semiotic, like language. This interpretation of 'action with symbols' seems justified when we consider Butt's definition of material action as "the role of the physical/material base of the activity in this context" (Butt, 2004:28). According to this definition and in the light of the term 'action *with* symbols' one could interpret material action as the

basic type of action upon which a description of the field of a situation is developed.[4]

The next choices available in the system of ACTION WITH SYMBOLS are [unnecessary] and [necessary]. Using terms such as 'necessary' or 'obligatory' (in the material action network) suggests some degree of 'interpretation' on the part of the analyst, and raises the question: How can one determine if material action is 'obligatory' or action with symbols is 'necessary'? Butt suggests 'necessary' has to do with the 'purpose of the Action with Symbols', but the criteria available to aid the analyst in selecting between these choices remains to be developed. From the choice [necessary] there are two primary choices: [Guiding (practical)] and [Telling (conceptual)]. If the choice is [unnecessary] then presumably the action would be non-semiotic action. Here, language would not be playing a role and the nature of the activity would revolve around some other kind of action.

15.5.2 Hasan's (1999) definition of material action

Unlike Butt, Hasan does not suggest 'degrees' of involvement like obligatory, oblique or absent with regard to material action, but there are some underlying similarities between Hasan's and Butt's concepts. Hasan's material action and verbal action networks are presented in Figure 15.3. In this version of her field network, Hasan argues for the inclusion of material action as a choice on the grounds that in accounting for language use in situations in which relevant material action occurs, the linguist needs to explain how these two facets of the situation (the linguistic and the non-linguistic) "co-operate within the same activity" (Hasan, 1999:275). Thus, 'material action' appears to be defined more along the lines of 'non-linguistic', rather than 'non-semiotic' as in Butt's network.

In order to understand Hasan's conception of the role of material action in the context of situation we need to first take a look at her definitions of constitutive and ancillary verbal action. Her definition of constitutive verbal action is contained in the following quotation:

> It is a commonplace of observation that in every known culture there exists a large category of social activities *that just cannot be performed except by languaging*, irrespective of whether or not they are also assisted by other semiotic systems, such as those of gesture or graphics. In an important sense, such activities are really semiotic, and more specifically they are essentially verbal. And not unreasonably their recognition as this or that kind of activity typically depends not on what else is going on physically/materially

[4] This interpretation of material action raises important issues regarding the concepts of 'relevancy' and 'context of situation'. If context of situation relates to language, then one would presume 'language' would be the basis on which the activity is built, rather than 'material action'.

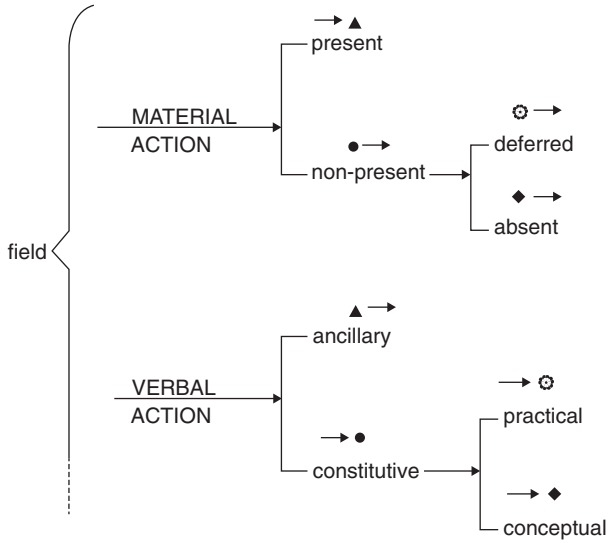

Figure 15.3. Networks for MATERIAL ACTION and VERBAL ACTION showing default dependencies[a] (from Hasan, 1999:279, 'Speaking with Reference to Context', in M. Ghadessy (ed.), *Text and Context in Functional Linguistics*, pp. 219–328. Reprinted with kind permission by John Benjamins Publishing Company, Amsterdam/Philadelphia <www.benjamins.com>)
[a] The default dependency symbols used for [material action: present] and [verbal action: ancillary] in Hasan (1999) were incorrectly displayed. They have been corrected in the version presented here.

at the moment of speaking but on what the verbal action itself is like . . . in such cases, the activity (i.e. field) is constituted by verbal action(s). (Hasan, 1999:276, italicised text in the original)

This description of constitutive verbal action appears somewhat different from other views of verbal action being constitutive of the situation, particularly in the comment "whether or not they are also assisted by other semiotic systems, such as those of gesture or graphics". This suggests that in situations in which both language and other semiotic systems are deployed in the construal of meaning, no matter the degree to which language is involved, if language is a 'necessary' part of the situation then the language, as far as field is concerned, would be categorised as [constitutive]. Hasan's definition would agree with Butt's definition of action with symbols as being 'necessary', but only if those actions were linguistic. It would encompass the selections [material action: absent: irrelevant] and [material action: oblique (marginal)], both in Butt's system network, but it could also include [material action: core (obligatory)] in

Butt's network if the situation demanded that language, too, were an obligatory element. According to her explanation, the obligatoriness of the language plays a role in the recognition of the nature of the activity. That is, even though material action may be involved in the situation, the definition of the nature of the activity is weighted more towards what is happening linguistically than materially. Before commenting further on this issue, we take a look at Hasan's definition of ancillary verbal action:

> By contrast with verbally constituted activities, there are some social activities which *just cannot be performed with verbal action ALONE*: they call for material action, although many will permit, if not actively require, some speaking as an additional resource in their performance. In this way verbal and material action coalesce into one activity: the material action is *present* and the verbal action may be employed as an additional resource in the performance of the activity. This type of verbal action is *ancillary*: it does not constitute the activity, it simply assists in its conduct. Since such activities are basically (material) *action based*, it is not surprising that their identity can be established more readily by an observation of the material action than by looking at what the speaking is like . . . [WB: referring to one of her texts she says] we noted . . . that it was fairly problematic to read the nature of the activity in this text's context by reference to the text's language alone. (Hasan, 1999:276, italicised text in the original)

This description of ancillary appears to correlate with Butt's definition of material action as being obligatory in the situation, but it also seems to express somewhat of a contradiction, particularly in the light of her comment that ancillary verbal activities may not only "permit", but may "actively *require*, some speaking as an additional resource in their performance" (Hasan, 1999:276, my emphasis). If such situations 'require' language, then according to the definition of constitutive verbal action, these should be classified as constitutive verbal activities whether or not there are other semiotic resources deployed in their construal. However, according to Hasan, with language ancillary activities, the basis for the recognition of the nature of the activity lies in the material action rather than the language taking place.

In Hasan's (1999) field network there are two choices for material action: [present] or [non-present]. Now, considering Hasan's descriptions of constitutive and ancillary verbal action, an interesting point with regard to the concepts of *present* and *non-present* material action is raised. Hasan argues that part of the linguist's job is to account for the co-operation of material and verbal action in situations where they both exist, and she contends that "linguistics needs to recognize both faces of action [WB: the material and the verbal] if it is to explain how the two might co-operate within the same activity when they are co-present" (1999:275). But the co-presence of material action and verbal action may still mean that the language is classified as constitutive of the situation according to Hasan's definition of language constitutive activities. That is, if we have a situation which 'requires' language to be present and which cannot

be conducted without language, 'includes' material action, but where the basis for the recognition of the nature of the activity lies in the language, Hasan's argument suggests that such situations would be classified as language constitutive. But this raises the question: How then do we account for the presence of material action in these situations? Do we simply 'ignore' the material action in situations which could be conducted by language alone but which happen to be conducted on this or that occasion by language *and* material action? Do we classify the material action that is taking place as non-present if the basis for the recognition of the activity is the language and not that activity? And how can we be sure that the recognition of the nature of the activity is really based on the language and not the material action taking place no matter how 'minor' that action may appear? Butt's networks seem to suggest that in these latter types of situations material action would be 'oblique'. But, as already noted, this raises the problem of what criteria one may use for determining 'oblique', 'necessary' or 'unnecessary'.

From Hasan's default settings, constitutive verbal action is a choice in situations when either material action is non-present, or when it is 'co-located' (as in washing-up but talking about politics) or 'aligned' (as in a simultaneous sports commentary). A choice of [material action: non-present] in Hasan's network makes available two other choices: [deferred] or [absent]. In a situation in which there happens to be some material action but the situation cannot be performed without language, such as a lecture which is conducted partly through some kind of physical activity, the choice in the material action network would have to be [non-present: absent]. But this does not seem to provide a means of adequately accounting for the relationship between language and non-linguistic matter, or how these configure in construing the nature of the activity in such situations. There is evidence in some of Hasan's examples that this line of reasoning is representative of her argument. However, there is also evidence indicating that it is not.

The evidence supporting this line of reasoning can be seen in her notion of constitutive verbal action with the subsequent choice [practical]. In Hasan's network, the default choice of [material action: non-present: deferred] is [verbal action: constitutive: practical] and this, she suggests, is applicable to instructional situations realised by texts such as instructions on how to connect a monitor to a computer (see Hasan, 1999:286). This may be a reasonable choice, and in line with this argument, the text presented in Figure 15.4 would also construe the choices [material action: non-present: deferred] and [constitutive: practical] in the field network.

In this text, the activity of 'knitting instructions' is wholly realised in the language; the pictures primarily act as a visual reference by which the instructee can confirm that he/she is following the instructions correctly (cf. Martinec & Salway, 2005). The visuals and the text form a kind of pseudo-instructor in that

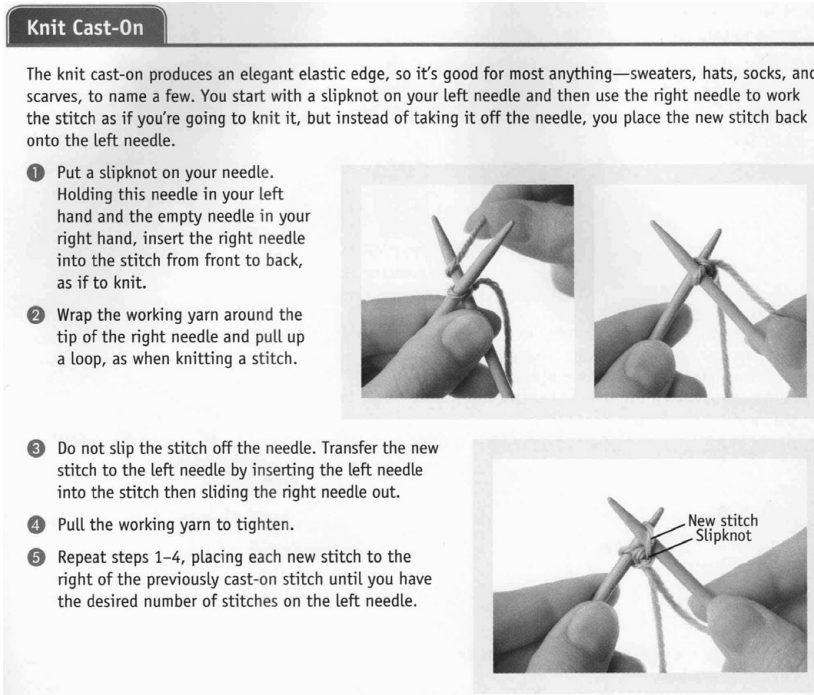

Figure 15.4. Instructions for how to 'cast on' in knitting (used with permission from John Wiley and Sons Inc, from Sharon Turner, 2010, *Teach Yourself Visually: Knitting: The Fast and Easy Way to Learn*, 2nd edn, page 18)

the salient visual information that the instructor would be showing in order to 'teach' or instruct the activity of 'casting on' is shown visually but explained verbally. Without the visual, one would have to know what some of the elements were, e.g. slipknot, stitch, (knitting) needle, working yarn, but the instructions and content are, in fact, all there, thus making this a language constitutive activity in terms of its field.

While some instructional situations such as that construed in the knitting text in Figure 15.4 are characterised by constitutive verbal action with referential visual material present, others are characterised by both verbal and non-verbal, or visual actions (see Bowcher, 2007, for a discussion of these kinds of text). That is, not all the actions or subject matter in the instructions may be realised through language. Some may be realised through non-linguistic matter.[5] This

[5] Some situations may be conducted solely through material action, e.g. showing rather than telling. But this kind of situation would likely be deemed out of the purview of 'linguistic' analysis as there is no language involved in its construal.

suggests that the choice [practical] should not be tied to the choice [verbal action: constitutive]. But this implies a different view of [material action: present]. It implies that the nature of the activity of some situations may involve two types of material action: that which is present and integrated with the verbal action in the set of instructions and the deferred material action, or the actual undertaking of the instructions. Thus, instructional situations where [practical] is chosen may be language constitutive or language ancillary activities.

This raises other issues, as in making these options available it appears that 'anything goes'. And yet we know that 'anything' does not 'go'. Choices relevant to any situation are not random. So investigating the constraints on the choices of these options is obviously of great importance if we are to develop a set of viable contextual choices. How to represent or account for those constraints is an issue not easily solved. It will require a corpus of different types of instructional texts with various combinations of linguistic and non-linguistic matter. To date, there has been little research on the linguistic and non-linguistic construal of instructional situations within the purview of developing contextualisation system networks, or in developing a continuum of the degree to which the linguistic and/or non-linguistic semiotic resources play a role in the construal of the nature of the activity (field) (see Bowcher, 2006, 2007).

Let us consider another type of text mentioned by Hasan, the post office sales text (see Hasan, 1999:226−227). If constitutive verbal action is a choice in situations where the event "just cannot be performed except by languaging" then this text should be classified as language constitutive because without languaging it would be difficult if not near impossible for interactants to get their meanings across. However, this text is classified by Hasan as language ancillary on the grounds that it "just cannot be performed by languaging alone". Indeed, as Hasan argues, there are certain features of this situation that simply cannot be performed by language, such as taking stamps out of a draw. So while it is reasonable to argue that the language is a 'required' component of the situation, a key feature of Hasan's definition of language constitutive situations, a closer examination of Hasan's argument shows that the important requirement for defining situations as 'language ancillary' is not that language is 'required' but that material action is required and where the language "may not be easily intelligible in dissociation from the workings of other modalities and/or the sharing of material environment" (Hasan, 1999:241).

In practical terms, however, this subtle difference between the two types of situation may be more difficult to deal with than it would appear. Some situations seem to fall somewhere in the middle in terms of the realisation of their meanings, with some situations leaning more towards the language-constitutive end and others towards the language-ancillary end of the continuum, although, as Hasan points out, there are certain activities which by necessity require

physical actions in order to achieve the desired outcome. In fact, Halliday suggests such a continuum. He proposes that field, or the nature of the activity

> includes everything from, at one end, types of action defined without reference to language, and in which language has an entirely subordinate role . . . through intermediate types in which language has some necessary but still ancillary function . . . to types of interaction defined solely in linguistic terms. (Halliday, 1978b:143)

Halliday's continuum suggests that ancillary language activities extend further along the continuum than constitutive language activities, whereas Hasan's definitions, at least with regard to instructional situations, seem to imply that language constitutive activities extend further along the continuum than language ancillary activities.

Hasan does permit the possibility of material action being present and the verbal action being constitutive of the situation. But in these situations, the material action is occurring 'alongside' the verbal action, such as driving a car while discussing linguistics with a passenger. In these situations, Hasan proposes that the system of ITERATION (see the 1999 field network) opens the possibility for material action to enter the conversation and thus be brought into the description of context of situation.

But why open this possibility if we are going to classify situations in which there is some material action as language constitutive events if the situation requires languaging and the recognition of the situation rests on what is going on in the language rather than in the material (or other) actions? One reason that Hasan gives for allowing for this possibility is that some situations can usurp the main context. For instance, you could be discussing linguistics while driving a car, but suddenly find you are being corralled into narrow side-streets because of a road-works detour, and you would need to concentrate more on your environment than on linguistics. And as your 'sayings' changed, so would the nature of the activity, at least in terms of 'relevant' context of situation. Constraints on the 'sayings' of interactants in some situations may also impose a kind of default choice. We turn to the issue of default dependencies in Section 15.5.2.1.

15.5.2.1 The issue of default dependencies

As already noted, Hasan includes default dependencies in her field network, and significantly in relation to the networks of material action and verbal action (see Figure 15.3). The default dependencies are listed in Table 15.2.

Default pairing number 3 appears to be most problematic in the light of instructional situations in which the nature of the activity is characterised by both linguistic and non-linguistic action. Such situations, where "the utterances often integrate with other non-language activity into a single event" (Halliday *et al*., 1964:92) in Hasan's analysis would be classified as language constitutive

Table 15.2. *Verbal and material action choices with default dependencies (from Hasan, 1999:280)*

1.	*if* verbal action [ancillary], then material action *must be* [present]
2.	*if* material action [non-present], then verbal action *must be* [constitutive]
3.	*if* material action [non-present: deferred], then verbal action *must be* [constitutive: practical]
4.	*if* material action [non-present: absent], then verbal action *must be* [constitutive: conceptual]
5.	Material action *may be* [present], and verbal action *may be* [constitutive]; this implies co-location . . . or aligned relation

situations. As the knitting text (Figure 15.4) shows, the text, while multimodal in nature, construes a language constitutive field where the material action is deferred. But this is not always the case, as discussed earlier and as highlighted in Bowcher (2007).

There are also occasions, both spoken and written, where non-language activities (or other semiotic matter) contribute to the construal of the nature of the activity but where the exact identity of the activity may not be obtainable from the language alone. Before we continue with this issue we take a look at Hasan's (2009c) field network as this issue is highlighted when we consider this network.

15.5.3 Hasan (2009c) and material action

The field network presented by Hasan (2009c) (see Figure 15.5) includes three primary systems: VERBAL ACTION, SPHERE OF ACTION and PERFORMANCE OF ACTION.

Without both verbal action and material action networks there is no need for default dependencies for these two features. However, we can see that the choice of [practical] can only be made within the network for [constitutive], so the problems raised in the previous discussion of the default pairings in the 1999 network and the relationship between material and verbal action in some instructional situations remain.

Hasan cites Halliday in her justification for taking out material action from the 2009 field network, commenting that according to Halliday "on the level of grammar or semantics this representation of constraint for choices across two simultaneous vectors would be considered ill-formed" (Hasan 2009c:189, n. 25). She suggests that material action can be built into the description through realisation because "material action is itself not in 'field': what is in field is reference to or traces of material action in the language of the text" (2009c:189, n. 25).

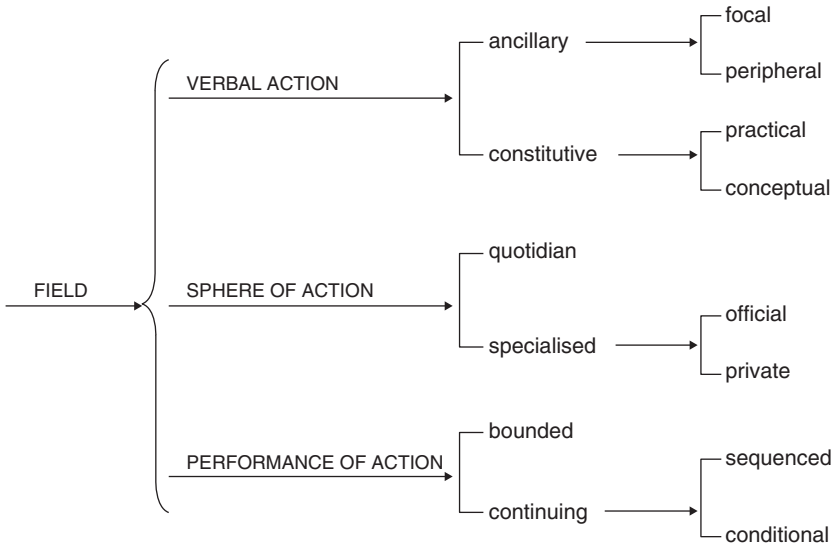

Figure 15.5. Primary and secondary systems and choices in Hasan's Field Mk2 network (Hasan, 2009c:183)

The issue of 'traces' of material action bears some discussion. Specifically, the issue is related to how one can determine contextual choices from the kind of 'trace' that may be present in the text. Recall that when features of the MSS enter the language, their meanings also, by default, enter into a description of relevant context (Hasan, 2009c:177). But 'material action' would seem to be a different kind of situational feature than the MSS. Unlike the MSS, whose identity may be brought into the description of relevant context, material action may play a significant role in the recognition of the 'nature of the activity' without it necessarily being explicitly referenced (see Bartlett, this volume). This is what lies behind the characterising of the role of language in such situations as 'ancillary' or 'facilitative', i.e. the language itself may be ancillary to or facilitating the social activity but not explicitly referencing or 'doing' the activity in any way.

Hasan points out that "If relevant context is that which is based on the interpretation of the language of the text, then, clearly, it is something 'made by (worded) meanings', which is to say that it is a SEMIOTIC CONSTRUCT" (Hasan, 2009c:177, capitalisation in original). Further, in paraphrasing Halliday *et al*. (1964), Hasan mentions that the "vectors of field, mode and tenor are relevant by virtue of the fact that they would always leave a 'trace' in the text: what is relevant in the context of situation would be illuminated by the language of the text" (Hasan, 2009c:176).

Thus, from this point of view, features of the context of situation are solely available from the language of the situation; that is, relevant context of situation is the "verbally construed three part construct composed of some doing, by some doers in some verbal mode of doing" (Hasan, 1995:219). However, as already noted, Hasan observes that in some situations it is difficult to grasp the nature of the activity from only the language of the text, which brings us again to Halliday's comment: "in the various spoken modes, and in some of the written, **the utterances often integrate with other non-language activity into a single event**. Clear instances of this are instructions and sets of commands" (Halliday *et al*., 1964:92, my emphasis).

Aside from the explicit monitoring of material action (e.g. a cooking demonstration), there are situations where the 'integration' of language and non-language activity may be such that the linguistic 'trace' of the social process is so imprecise or scant that the language alone may give little clue as to the nature of the activity. That is, in order to understand the nature of the activity, the field of discourse, one must have access to the material action, the non-linguistic goings-on in the situation. This raises an important issue regarding the concept of 'relevancy', suggesting that the issue of relevancy is particularly important when considering the system networks of VERBAL ACTION and MATERIAL ACTION within the parameter of field.

15.6 The issue of relevancy

What is typical of situations in which language plays an ancillary role is that, in order to make sense of the language used in the situation, one needs to have visual (or some other) access to the materiality of the situation. In the transcript of the father–child talk, Halliday makes up for the reader's lack of visual access by indicating what material actions are accompanying the talk, and in the field description he refers to these actions as 'manipulation of objects'. So it seems that some kind of 'selection of relevant material actions for annotation' has been made, informed by what was both 'said' and 'done' in the situation.

What then of those situations in which language is playing a very minor role, where linguistic 'traces' of the nature of the activity are virtually non-existent[6] and where the field description can only be made by reference to other features of the situation, or to the event as a whole, as both Hasan and Halliday have commented? One such situation may be seen in the page-based instructional multimodal text shown in Figure 15.6.

[6] I say 'virtually' because my concern here is only with situations in which language plays a role, i.e. field within the 'traditional' concept of context of situation.

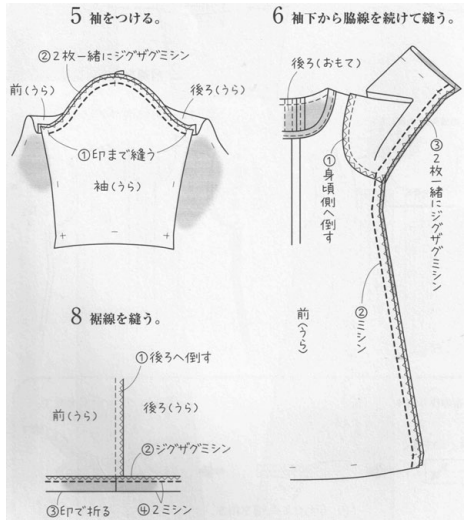

Figure 15.6. Sewing instructions with visuals (permission to use this image kindly granted by Boutique-sha of Japan (see <www.boutique-sha.co.jp>). Image showing steps 5, 6 and 8 for the sewing pattern for 'Check One-piece' on page 36 of *Lady Boutique Series* no. 3087, published by Boutique-sha, designed by Reiko Iizuka)

In Figure 15.6 we can see that the visual matter, including the drawings of the pattern and the lines from circled numbers to specific points or markings on the pattern, works in tandem with the linguistic matter to instruct the viewer on how to attach sleeves or sew seams and hems of a garment. The extent of this co-operative construal of the activity is highlighted if we take away one of the semiotic systems at work. Figure 15.7 reproduces step 5 (attaching the sleeves) without the visual matter. Here we can make out that we need to attach sleeves, but the precise nature of the activity is difficult to ascertain because of the lack of visual matter. This kind of problem is highlighted even further when we consider another type of text, this time a spoken text transcribed as Extract (3).[7]

Extract (3) Transcription of spoken text from the American sitcom *Friends*. Here the friends are playing a game of American football.

1. J: I got it
2. M: Go go go
3. R: Oh

[7] This is a very brief extract and more language from the situation would likely provide more clues as to the activity, but the details of the activity would still be virtually impossible to ascertain.

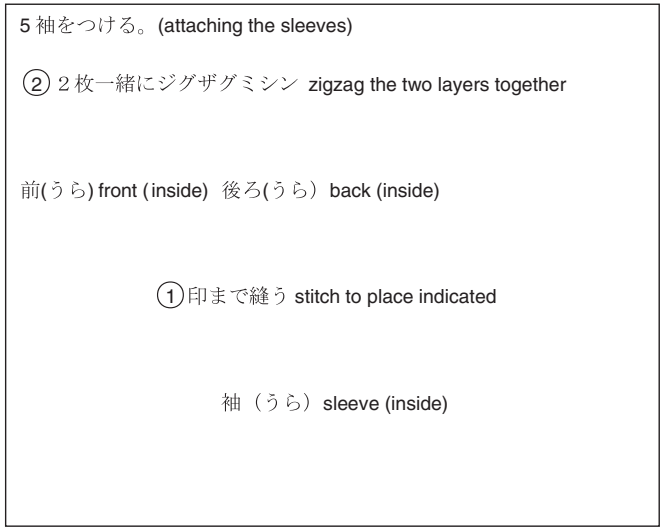

Figure 15.7. Step 5 of the sewing instructions without the visual matter (and with translation)

4. J: Wooh wooh hoo
5. P: Eee
6. M: Whaoh score!
7. Seven to nothing

. . .

33. R: One Mississippi two Mississippi
34. Switch switch switch
35. C: No no no no no no no no

In this situation the physical activity is construing many of the features of the situation as well as the relations between these features. The language is expressing some concepts (such as 'score' and 'seven-to-nothing'), as well as some processes ('go', 'switch') but the relationship between these processes and the rest of the actions, participants and circumstances in the situation is unclear. The language also expresses evaluations of events, which construe tenor and field features, as well as mode features when we consider the form these expressions take. However, it is unlike the father–child talk where one could make out quite a lot about the situation without access to the material goings-on or without access to the annotations provided in the transcription (Extract (2)). It is also unlike the sewing text where, without the visuals, we can figure out that the text is about attaching sleeves and sewing something together, but the

precise details of the 'nature of the activity' are not possible to ascertain. In Extract (3) there is very little of the context that is linguistically construed. We could deduce there is some kind of game, but the type of game would remain a complete mystery. It is precisely because of the role of the material actions in the construal of the situation that 'traces' of the context are so scant in the language itself. This suggests that without the inclusion of material action as a feature in the field, it may be difficult to account for the nature of the activity in certain situations.

If language is the window to the social process, and with regard to field, to the nature of the activity, and if relevant context of situation is obtainable from language alone, it would seem the 'relevancy principle' is weak because in some situations the language only partially realises the nature of the activity. So perhaps we should ask, 'Is that all we can hope to achieve in terms of a linguistically construed "relevant context" when language is playing a very minor role?' If our answer is yes to this question, then we have a well-constructed framework for developing a description of such contexts of situation in the CMH hypothesis. However, some of our description would lack many of the specifics of the situation which characterise the nature of the activity, and indeed, may lack the very details of that which is 'relevant'.

In descriptions of language as social semiotic, field has consistently been defined according to the 'nature of the social action' in which the speaking participants are engaged and in which "language figures as some essential component" (Halliday & Hasan, 1985:12; cf. Halliday *et al*., 1964:92, quoted previously). So to arrive at a satisfactory, more comprehensive description of the 'nature of the social action' our description of context of situation should provide those features that motivate the configuration of meanings, the "realization-activating contextual features" (Hasan, 2009c:181). Thus it would seem that when presenting the possible options available in the parameter of field, we would need to provide the choice of [material action] if material action were a 'realisation-activating' feature of the context. If the text were one in which visual matter were playing a role in construing the nature of the activity, as in instructional texts where some, but typically not all, instructions and other subject matter may be visually construed, then we would need to provide for the possibility of visual matter or visual action, or something like that, to be included in the field network. I am not suggesting that as linguists we need to develop the networks for these features of the situation, this would be a job more adequately suited for semioticians, but, as Hasan has observed, the linguist needs to explain how the linguistic and the non-linguistic "co-operate within the same activity" (Hasan, 1999:275). So we need to make some option to account for these non-linguistic 'relevant' features in a contextualisation system network.

15.7 Conclusion: 'material action' as choice in field

Halliday contends that the semiotic features of the situation "activate corresponding portions of the semantic system" (Halliday, 1978b:117). So a reasonable question with regard to material action is: Is material action a semiotic feature that activates features of the semantic system? And, does material action play a role in our understanding of the nature of the activity in a given situation? We know that there are situations in which some material action may occur but may not be 'semiotic' in nature. That is, it may not necessarily 'mean' anything within the social activity in which language is playing a role. Unfortunately, in this chapter there has been little time to spend problematising this distinction. Rather, I have taken the view that if non-linguistic matter, whether semiotic or not, is involved in activating choices in the sematic system and playing a role in characterising the field of discourse, then it would need to be a part of a description of context of situation. I have also implied that material action may encompass a range of systems, such as gesturing and moving in specific ways, as well as other kinds of visual resources. When material action is 'integrated' with verbal action in specific and meaningful ways, in that together they play a role in the recognition of the nature of the activity, then they both need to fall within the selection of relevant features of the context of situation. This interpretation of 'relevant' would appear to accord with Halliday's description of language as a social semiotic and the context of situation as a semiotic "construction of meanings" (Halliday & Hasan, 1985:29) relevant to situations in which language is involved in some way.

If field is the 'nature of the activity' in which language is playing some part, then it is a given that, as linguists, we need to be able to account for the role that language is playing in its construal. However, if some non-linguistic matter is also playing a role in characterising the nature of the activity, no matter how minor this may be, then we need an appropriate entry point for certain choices within the field network that account for this, otherwise our description of field would be impoverished, and considerably so in some situations. If the nature of the activity is multisemiotic, then a system such as MATERIAL ACTION could cover a range of non-linguistic but relevant features of the situation. Thus, at this point, keeping material action as a choice in field seems to provide for this opportunity. Due to the apparent multi-faceted definition of 'material action' implied in this chapter, it may be better to label this choice as 'non-linguistic'. However, relabelling should not be done without careful consideration, so this, too, may be better left for future discussion. Importantly, and in relation to the issue of default settings, in this developmental stage of contextualisation system networks, it may be worthwhile to refrain from constraining choices with default dependencies, as Butt has suggested.

There is, of course, the possibility that the meanings activated by both material and verbal action may overlap; certain meanings may be redundantly coded (Hasan, 1981), and the semiotic choices within the field network deriving from material action and verbal action may coincide or diverge due to the peculiarities of the semiotic modes utilised (Kress & van Leeuwen, 2006; Hasan, 1981) and the nature of the activity itself. As the contextualisation system networks develop, further features relevant to material action may be described in a separate system network, comprising a separate set of field, tenor and mode networks that can be analysed alongside a system network for linguistically construed context of situation. This seems to be a possibility in view of the current work in SFL-based multimodal/multisemiotic discourse analysis, including those analyses of situations in which language does not figure at all. Nevertheless, as linguists we need to keep in mind that "linguistic analysis can assign some value to 'silence' and/or physical action only in the context of speaking, when it is surrounded by language, not when it occurs divorced from language" (Hasan, 1999:275). The challenge raised in this chapter is to develop a framework that sets out the potential features which play a role in defining the nature of the activity, the field, in situations where language is involved. For the moment, keeping the system of MATERIAL ACTION in field provides a means of doing that at least to some degree.

15.8 Final remark

This chapter began by raising certain questions regarding the inclusion of material action as a choice in the contextualisation system network for field. Through the discussion, however, many more questions have been raised. The exploration of context and its representation as a system network, and specifically the issue of the inclusion of material action as a choice in the network of field, is not an easy endeavour. Any one of the questions raised explicitly or implicitly in this chapter could point to fertile avenues for developing our understanding of the relationship between linguistic and material action, multisemiosis, the representation of semiotic features as a system of choices, and what theoretically count as relevant features of context.

16 "I'll manage the context":[1] context, environment and the potential for institutional change

Tom Bartlett

16.1 Introduction

In the opening chapter of this volume Halliday states that "probably the single most effective device whereby a language increases its meaning potential" is the tendency for systems to become simultaneous rather than dependent: that is to say, when options that were previously restricted to certain environments become more generally available. An example from the lexicogrammar of English would be passive constructions, the use of which was previously dependent on certain choices from within the tense system, but which now comprise an independent system that is freely combinable with all tense forms in English (a certain degree of ungainliness notwithstanding). The aim of this chapter is to discuss the conditions under which a similar expansion of the meaning potential can occur, at a higher level of abstraction, in terms of the range of *coding orientations* (Bernstein, 1990) which can be effectively employed within different sociolinguistic environments. More specifically, the paper considers the disarticulation of institutional activities from the coding orientation of the dominant social group as the default means of enacting these and the integration of local coding orientations, alone or in combination, as legitimate alternatives. Figure 16.1 represents this development from disjunctive to conjunctive options and the resulting increase in choice, or *meaning potential*, within these environments.

Non-conventional discourse practice is, of course, an 'option' in any environment, and it would be possible to analyse any such practice in terms of the distinctive features it exhibits and their relationship to alternative social practices and ideologies; however, as Hasan (1995:249) puts it:

> . . . to imagine that, by revealing disjunctions, we could bring about revolutions, does appear to me somewhat grandiose. It suggests quite wrongly that the material effects of

[1] Overheard on a train on my way to the conference where I presented the first draft of this chapter. This simple phrase captures two SFL principles that are fundamental to this chapter: that the context is not 'that which is there' but what we make of it; and that the construal of context motivates subsequent behaviour. It also suggests the complementary perspective that this chapter attempts to elaborate on: that, under the right circumstances, context can be manipulated.

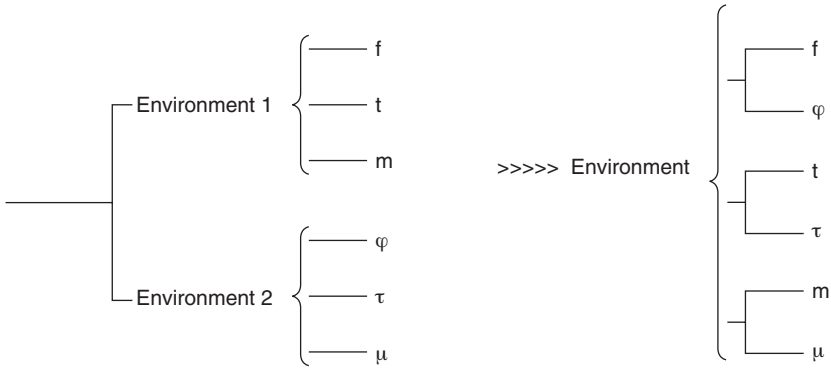

Figure 16.1. Development from disjunctive options in different environments to conjunctive options across environments. f, t and m = dominant field, tenor and mode; φ, τ and μ = local field, tenor and mode

past semiosis – the institutions, practices and systems of belief that have been created through interactions using various semiotic modalities – are so insubstantial as 'to keel over' at our new and daring *verbal* semiotic adventures in combining the uncombinable!

A fuller consideration of such disjunctions as alternative and potentially emancipatory practices would have to account for several factors: the conditions of possibility behind their emergence; their function within the current social environment; and the extent to which they perturb the potential for future discourse. In Bartlett (2012) I describe in detail such a process of change from the perspective of intercultural development discourse in Guyana; in this chapter I set out a general, if embryonic, framework for the analysis of such situations in terms of three key sociolinguistic concepts: (i) the relationship between the social environment as potential and the actively construed context[2] as instance; (ii) the relationship between codes in contact; and (iii) the role of individuals, as multiply socialised agents, in combining codes in context. In Sections 16.2 to 16.5 I relate these concepts to SFL theory and architecture and signal where theory and methods from other social sciences can complement SFL in describing "institutions, practices and systems of belief"; in Section 16.6 I briefly illustrate how these three variables interact in practice to enable individual instances of alternative practice, drawing on examples from my fieldwork in Guyana; and I conclude with a short consideration of the process by which such practices might become more widely available as discourse options. My approach is thus an alternative to empowering marginalised groups

[2] I have used the term 'actively construed' in preference to the usual 'semiotically construed' as it might be argued that features of the static environment are nonetheless semiotic.

through training them in the dominant code (as with Berry, this volume, and Rose, 1999); the important point, however, is that this more 'radical' option is not always a viable one and that it is necessary to determine under what conditions it might be possible.

16.2 Environment as context potential

In SFL theory there is a distinction made between what might be called the *environment*[3] of talk and the *context of situation*: the environment comprises the semiotic matter that is 'already there', while the context of situation is 'what the participants make of what is already there as a social activity'[4] (and cf. Goodwin & Duranti, 1992:4, for a similar viewpoint from outwith SFL). In these terms, context comprises only those features of the environment (including prior talk) that are construed as relevant to the current activity through the semantics of the talk itself, with the field, tenor and mode of the context congruently construed through experiential, interpersonal and textual semantics respectively. In this way SFL is able to show how "we get from the situation to the text [and] what features of the environment, in any specific instance, called for these particular options in the linguistic system" (Halliday, 1978b:142) without assigning causal precedence to either the text or the context: it is the verbal activity that *construes* the context, while it is the features of the context that *activate* the semantic domains that between them comprise the register of the verbal activity (see Hasan, this volume). In other words, within any given spatio-temporal setting there is a range of semiotically charged features, the meaning of which to those present is a function of their past interaction with the same or similar objects, activities and relations, but only some of which are construed as relevant context. These features form part of the speakers' *semiotic histories* (cf. Hasan, 1995:249, 1996d:41; Goodwin & Duranti, 1992:4), elements of their socialisation into cultural norms, and all of them could potentially have been made relevant, been *encontextualised*, as part of the ongoing verbal activity. SFL, in general, focuses on those elements that are encontextualised, largely neglecting the question of what alternatives were possible and why particular contexts were favoured over others. This has led to accusations of *textual bias* (Blommaert, 2005:35) – a criticism which perhaps resonates with Hasan's words above about the wishful thinking of those who

[3] This is the term used by Halliday in the quote later in this paragraph, though other authors use different terms for similar concepts. Elsewhere Halliday (1978b: Chapter 7) talks of first- and second-order context, but the correlation between these terms and what I am calling environment is not completely clear and the terms have not been widely used since. Berry (this volume) talks of the *situation*. However, this term can easily be confused with the more specific concept of *context of situation* and so I shall not use it.

[4] My thanks to Margaret Berry for the rough form of these glosses.

celebrate alternative texts without due consideration of their relation to wider environmental factors. From the perspective of this chapter two significant questions arise: What are the factors that motivate the construal of one particular context, *ab initio*, from amongst those that are theoretically available within the environment? And what factors in the environment are liable to lead to a change of an already *active* context? An important consideration for both questions is the *nature* of the relationship between context and environment, and I shall turn to this first.

Contexts of situation are related to the *context of culture* as instances of that culture (Halliday, 1999:1; Hasan, 1995:213), while context of situation and language are connected through a relationship of *realisation* (which comprises the symmetrical processes of *activation* and *construal*): the context is realised through the semantics, which is in turn realised through the lexicogrammar. However, neither relationship can be said to hold between the context and the environment, which is a part–whole relationship, but one involving the selection of alternatives at the same degree of abstraction rather than the instantiation of a higher-order system. The environment can thus be seen as constituting a *context potential*. Those contexts *at risk* will be a subset of the context of culture (cf. Martin, 1999:40), with the range of options motivated and narrowed as a function of the material features of the setting, the semiotic histories of the different participants with regard to these features, and wider socio-cultural structures.

However, not all contexts at risk are equally so, with environmental features again determining the *unmarked option*, with *marked options* more or less likely or more or less highly evaluated. The relationship between environment and context is thus best described as one of *tendencies* or of *favoured* contexts being 'chosen' (in the SFL sense, without any necessary implications of intentionality) from those at risk within the environment. Thus, for example, in the production of essays on 'My Home Town' as an academic exercise (see Berry, this volume), while students might construe a highly personalised account of their life in their home town, impersonal, factually based accounts are generally more highly evaluated. Similarly, as Blommaert (2008) has shown, in making written applications for asylum, the coding orientations of many applicants are considered as inappropriate and the applicants are judged as not having adequately addressed the questions asked of them. Blommaert (2005:73–74) refers to this hierarchical ranking of coding orientations within a given environment as the *order of indexicality*.[5] And the more institutionalised the environment, the stricter the order of indexicality, as Hasan (1999, 1996d:48) and Bowcher

[5] Not to be confused with Silverstein's (2003) term *indexical orders*, which refers to degrees of awareness of indexical difference .

(1999) demonstrate. In such environments, the unmarked tendency is considered not only as preferable, but also what 'should be'.

The concept of a *context potential* thus completes the theoretical framework of how we get from the environment to the text, rather than simply from the context of situation to the text. Within any given environment, the material features of the setting, the personal histories of the participants, and the wider socio-cultural structures (all of which are semiotic in nature) mean that a limited range of contexts will be at risk, while these same environmental features will determine the ranking of these contexts within the order of indexicality. Once the context is established, certain domains of meaning are activated within the experiential, interpersonal and textual semantics, with these meanings then realised in specific form through the lexicogrammar. An important corollary of this view of the relationship between context and environment is that within any environment there will be many potential but unrealised or 'silent' contexts (cf. Hasan's, 1999:253ff., discussion of silent activities that may disrupt active contexts), and that, *given the right conditions, these silent contexts may be activated and ultimately supplant* (Hasan, 1999:264) *the current context*.

With regard to the specific topic of this chapter three broad questions arise:

- What contexts are at risk in a given environment?
- What are the different coding orientations, the relations between language and social history, that underlie the various options in context?
- What is the social basis of the order of indexicality of these coding orientations in that environment?

These are questions that demand input from sociological and ethnographic as well as linguistic theory, as Hasan (1995:267–268) states:

> [T]he description of the options in the context of culture has never been articulated in any detail [within SFL]. Perhaps one is tacitly saying with Hjelmslev that, at this point, the sociologist and/or anthropologist will take over. Certainly, linguists as linguists are not able to analyse – or are at least limited in the extent to which they can analyse – the crucial properties of culture [as . . .] there will inevitably arrive a stage where the highest stratum would not be wholly describable in terms of language.

This is not to say that the context of culture is not a semiotic construct, but it does mean that, in order to explain how specific contexts of situation come into being, we have to look beyond text to the semiotic histories that are embedded in the wider environment, and this is the domain of sociologists and anthropologists. A similar point is made by Blommaert (2005:235):

> If we see discourse as contextualised language, and take this dimension of contextualisation seriously, we shall be forced to develop a linguistics that ceases to be linguistic from a certain point onwards, and becomes a social science of language-in-society.

Answers to the questions above will lead to four more specific questions:

- If we see an environment as a locus for contesting alternative potential contexts, under what conditions can the marked option be brought into play to achieve strategic short-term goals?
- Under what conditions and by what processes can a marked option be made the (coequal?) unmarked option in a given environment?
- What sorts of context are more permeable to change, and in what ways (questions already addressed by Hasan, 1999, and Bowcher, 1999)?
- In what way can individual speakers contribute to this change?

In terms of the focus of this chapter, these come down to a single broad question: In what ways can inactive or 'silent' features of a given environment alter the ongoing construal of context, *even in highly institutionalised environments* (cf. Bowcher, 1999)? To approach that question, further exploration of the relationship between context and environment is first necessary.

16.3 Context, environment and semiotic history

The dividing line between the concepts of context and environment has proven to be a fuzzy area within SFL at both the practical and theoretical level and, although attempts to identify the variables of context have been a central aspect of SFL for several decades, few definitive conclusions have been reached and networks of contextual features remain largely intuitive and typological in nature (Hasan, 2009c:167, 180; Halliday, this volume). Hasan, generally following Halliday, has provided various glossings of context: as those aspects of the situation that *leave a trace* on the text (Hasan, 2009c:177); as those aspects of the situation that are *illuminated* (Hasan, 1995:219, 2009c:176–177) by language; and as those social practices that are *construed through the text itself* (potentially in combination with other modalities) (Hasan, 1995:213). While such metaphors help us to gain an intuitive understanding of what is meant by 'context', they provide overly vague criteria by which to identify elements of context and can in practice prove contradictory.

Cloran (1999:178), following Hasan, distinguishes between the actively construed context and the 'Material Situational Setting' (MSS) in which the text is situated:

> The MSS may be thought of as an actual physical space containing actual physical elements. Context, on the other hand, is a theoretical construct, abstracted for metalinguistic purposes from the MSS. This physical space, the MSS, may most usefully be considered to be a potential interactional frame. Its elements are the human and non-human entities and their attributes, any on-going non-verbal activities or states, and any circumstances, e.g. time of day (Firth 1957). These elements may constrain any interaction – any context – that may be negotiated, and do so either singly or through complex interaction, e.g. on-going activities by time of day. In other words, the elements of this interactional

frame – the MSS – may have a semiotic value which arises from conventional usage and which must be recognised when negotiating a context for interaction.

Hasan and Cloran have also provided corollaries arising from these distinctions between context and MSS: first, that, as context of situation is actively construed, "prior to language there is no context" (Cloran, 1999:180; cf. Hasan, 1999:221); second, following from this, that context can be read off from text (Hasan, 1995:228); and third, that it is features of either the existing context or the MSS (Hasan, 2009c:170, 176–178) that are the raw material from which new contexts can be construed. In attempting to make a motivated and practical distinction between environment and context I shall consider first how well these statements capture the crucial distinctions between environment and context, and second whether Hasan's and Cloran's conceptualisation of the MSS adequately captures the full range of ways in which the environment can influence the context.

16.3.1 Trace versus construal

While at face value the three metaphors for the context of situation, above, seem to be compatible, a closer consideration reveals that there are discrepancies between them as well as problems with the idea that the context can be read off the text alone (see also Bowcher, this volume). This can be illustrated by the sketch in Figure 16.2 and the accompanying text.

How do we make sense of this text, rather than just describe it? There are several features that need to be considered together. First, the date and time: it is just past midnight on New Year's Eve; second, the location: this brief encounter is taking place in Scotland, where New Year's Eve (Hogmanay) is a particularly important time of year; and, third, Jock's red hair. Taking these factors together, we need the cultural knowledge that in Scotland it is considered bad luck to be 'first-footed' by someone with red hair (that is, for a red-haired person to be the first to cross your threshold at the beginning of the year). From this example we can claim that Jock's red hair has 'left a trace' on the text, but it would be a stretch to say that the text 'illuminates' this feature of the environment, and it would be impossible to claim that Jock's red hair has been construed through language or that it can be read off the text alone. There is thus a contradiction between different criteria for identifying 'context of situation', and while the example of 'The Hogmanay Text'[6] might appear trivial, more extended examples can easily be found. Consider, for example, the difference in confidence I feel when discussing business in my own office rather than in someone else's – the Head of School's, for example – or the

[6] My thanks to Mick O'Donnell for gracing my example with this title!

"I'm sorry, Jock, you'll have to come back tomorrow."

Figure 16.2. A situated text

still greater differences when having the 'same' conversation in a pub. In these cases the different *settings* clearly leave 'traces' on the text, though they cannot be said to be construed through the text nor can they be read off the text alone.

These examples highlight, in extremis, a problem that I believe resonates throughout SFL attempts to model context according to the various criteria given: the inclusion in context networks of features of the environment that are likely to constrain the type of texts produced rather than just those features that are actually construed through the language of the text itself. Such a conflation carries the danger of suggesting appropriate behaviour – as envisaged from the cultural perspective of the analyst (Poynton & Lee, 2009) – rather than highlighting potential tensions between expectations and actual practice. The point can be made with reference to the inclusion of written and oral channel and/or medium within the contextual category of mode rather than as an aspect of the *motivating environment*. Such a position leads to many problems, linguistic and political, as we see huge varieties in writing styles across, for example, age groups and levels of education (see Berry, this volume, for further discussion on this point). In children's writing, for example, there is a much higher use of the supposedly 'oral' feature of exophoric deixis than in 'educated' adult writing. In saying that children's writing does not fit the criteria for 'written' text are we therefore saying that it is wrong or deficient rather than simply different? More

contentiously, what of the written texts produced by asylum applicants in Belgium, as discussed by Blommaert (2008)? These displayed few of the properties of written text expected by Belgian immigration officials, which we can assume correspond, at least broadly, with those semantic and lexicogrammatical features posited as construing the medium option of 'written style' in, for example, Matthiessen's (1995:52) network. And Hasan's (1995:228) statement that 'normal' speakers are able to recognise activities from the linguistic features they display, though possibly a slip, illustrates the dangers in associating the extra-environmental features of channel with specific linguistic resources. Would it not be much more appropriate, therefore, to describe the mode of both the children's and the asylum speakers' texts in terms of the coherence and textuality they construe (cf. Cloran's, 2010, Rhetorical Units), rather than as 'written', and then to discuss how they are different from written texts produced within other *environmental configurations* and whether and how this is important at the social level?

Blommaert (2005:4–5) summarises this problem in terms of Hymes's (1996) concept of *voice* as the set of linguistic resources available (or appropriate?) to different communities (a concept I will return to below):

> Voice stands for the way in which people manage to make themselves understood or fail to do so. In doing so, they have to draw upon and deploy discursive means which they have at their disposal, and they have to use them in contexts [read environments: TB] that are specified as the conditions of use. Consequently, if these conditions are not met, people 'don't make sense' – they fail to make themselves understood . . . An analysis of voice is an analysis of power effects – (not) being understood in terms of the set of sociocultural rules and norms specified – as well as conditions of power – what it takes to make oneself understood.

To summarise, I would claim that there is an important difference to be maintained between those features of the environment that are construed as context through the language of the text and those that leave an *oblique* trace on the context but which are not themselves part of the context as actively construed. In separating environment and context in this way we are able to distinguish better between what linguistic behaviour is *expected* and what is *possible*. In Section 16.3.2 I consider whether Hasan's and Cloran's conception of the MSS provides an adequate account of the motivating environment.

16.3.2 What features of the environment can be construed as context?

If we consider the statement that there is no context before language as an entailment of the SFL concept of context of situation, then we can take it as unproblematical *within this theoretical framework*. However, taking this definition leads to problems with the claim that only the features of either

the existing context of situation or the material situational setting can alter the context. As an example, let us consider two people entering a lift in a hotel lobby and striking up a conversation. I have chosen this seemingly trivial example as it is the most realistic scenario of how contexts are construed *ab initio* that I could think of, and the fact that the speakers do strike up a conversation is enough to disprove the claim that only the existing context of situation can provide the basis for further talk. What other factors might then provide the raw material for future contexts? As one instance, we could imagine that these two people are old friends who recently had a conversation which they now resume. Such a case would imply that environmental factors influencing context might include past encounters, present in the memories of the speakers, though not in any 'material' sense and not having a semiotic value which arises from *conventional* usage, as required by Cloran's discussion of the MSS, above. Such past encounters could, of course, be seen as constituting the same context, dispersed across time and place. However, these past encounters need not have involved language: one of the two in the lift, for example, may have inadvertently kicked the other on their way to the office the previous week, with this incident providing the basis for an ill-natured exchange in the lift. On the other hand, the two may never have met but, sharing a common culture, they know that it is appropriate on such occasions (assuming they are British) to exchange brief greetings and then to stare awkwardly at their shoes until one gets out at the appropriate floor and the mutual embarrassment can end. In such a case, we could infer that social conditioning, again part of the environment though not materially present or necessarily conventionalised, provides the stimulus for their (admittedly minimal) verbal behaviour. Though these examples may once again be rather frivolous, they do illustrate a point that will be important for my discussion: that there are environmental but non-contextual factors of different kinds that influence the production of talk (or writing) and that these need not be materially present or conventionalised. And to the varieties suggested by the lift example can be added the limiting case of imagined or desired contexts, as with fairy tales or the contrived chumminess between boss and employee. Figure 16.3 represents a possible cline along which environmental factors that lead to the construal of context are removed from the current context.

It is important to stress that I am not taking issue with the claim that before language there is no context; rather I am using this axiom to demonstrate the difference between context and environment and to show that non-contextual and non-material features of the environment have their effect on talk. More specifically, it is the speakers' perceptions of such environmental features and how they can be accommodated into their wider worldview that motivate choices in construing contexts. Hasan (1995:249, above) similarly includes participants' "systems of beliefs" within the "material effects of past semiosis" (an inclusion

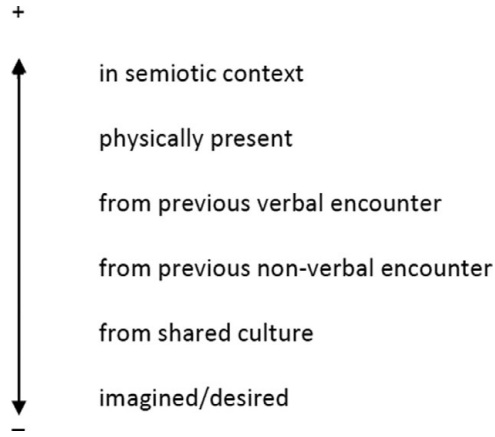

Figure 16.3. A cline of influencing factors in the environment

which stretches the concept of materiality[7]), and elsewhere (Hasan, 1995:266) states that the SFL model:

> . . . would make sense only if it assumed that speakers' perception of context plays a criterial role in the form their interaction takes, just as the addressee's understanding and validation or rejection of the speaker's position plays a criteria role in the construal of the shared context.

I shall return to this point below in discussing the role of the individual in affecting ongoing contexts.

In line with general SFL theory, however, it is worth stressing that environmental factors influencing the construal of context, even the unintentional kick in the shins, are by definition semiotic, as it is only through the speakers' assigning meaning to them that they can be taken up within the linguistic context. Similarly, it is not Jock's hair that bars him from first-footing, but the superstitions regarding red hair that operate as a semiotic mode within the community and into which Jock's interlocutor will have been socialised. In distinguishing between context and influencing environment we are not therefore distinguishing between semiotic acts and non-semiotic features, but between current processes of meaning-making and *semiotic histories* as motivating factors.

[7] The term 'Material Situational Setting' for me conceals the importance of such aspects as the speakers' semiotic histories and their relations to wider social structures. The use of the term would seem to be making the point that such features are ultimately material, in contrast with dualist conceptions of mind and matter, but in this case the term 'material' is redundant, while the reduced 'situational setting' would still deemphasise the importance of past semiosis and wider structures.

In these two sections I have suggested that, on the one hand, a more rigorous distinction needs to be made between the context as actively construed and the environment as a motivating factor and, on the other hand, that Hasan's and Cloran's conception of the motivating environment as the Material Situational Setting needs to be expanded to include a greater range of *semiotic cues*, including non-conventionalised and non-material features.[8] In Section 16.4 I will expand on the notion of non-conventional features in terms of the differences in coding orientations of different subgroups within the same broad 'culture'.

16.4 Cultures, subcultures and linguistic systems

The aim of this chapter is to consider the conditions necessary for previously excluded coding orientations, or codes, to become legitimate and effective options in new environments, so it will be necessary to discuss briefly the relationship between different codes and the way in which they can interact.

Within the framework of SFL language variation is often described as falling into two categories: *diatypic* variation, with differences in semantic and lexicogrammatical choices – different registers – activated by the different *uses* to which language is being put; and *dialectical* variation, where differences are a function of the different *users* (Halliday, 2007b). Halliday (2005b:71) states that "register variation is the resetting of the probabilities in the grammar"; that is to say, choices *which are generally available* within the semantic and lexicogrammatical systems, such as passives or technical lexis, occur more regularly in some registers than in others. Elsewhere, Halliday (2005a:50–51) suggests that dialectical variation can be accounted for in the same way. In these terms, different dialects and registers belong to the same general cultural system, with probabilities of use under different conditions being built into the system as a significant component (2005a). Coding differences, however, encompass differences by use and difference by user simultaneously, and as such can be regarded as "likely to be a realisation of different social structures" (Bernstein, cited in Hasan, 1973:258). Such differences are accounted for in the theory in describing the overarching context of culture as a *metastable* system (Halliday, 2005a:44), but I would argue that different social structures amount to more than variation within a single system as there is a difference both in the

[8] The distinction between environment and context raises issues concerning metafunctional congruence between different strata – environment, context, semantics and lexicogrammar – commonly referred to as the 'context-metafunction hook-up hypothesis', and whether this congruence extends to the relationship between environment and context. For reasons of space I have not included such a discussion here, but I hope to return to this topic in future publications.

range of semantic options available to different groups and in the lexicogrammatical forms realising semantic choices rather than simply a resetting of the probabilities for *generally available choices*.

To give an example, in Guyana (as in other places) it is customary to refer to friends with a 'higher' status by their title and first name, as in 'Dr Tom'. This is unproblematic when considered purely as a novel combination of lexicogrammatical features from within the same system; but the interpersonal semantics realised this way (+solidarity, +high status) construe a type of relationship that my lexicogrammar can only construe through the distribution of elements across the clause, or even the text. And while the potential to combine these lexicogrammatical elements to construe a novel semantic option exists within my system, there is no reason to assume that I would use the conjunction to the same semantic effect, which is, after all, more than simply the sum of its lexicogrammatical parts. To complicate matters, Guyanese English also uses the lexicogrammatical form UNCLE + first name as a signifier for the intra-community relationship of (+familiarity, +high status). This means both that Guyanese English has interpersonal options available at the semantic stratum that are not available within my code, but also that the features we do 'share' derive different meanings in as much as they fall within a different set of *valeur* oppositions. Further, as semantic meanings function to construe the tenor of context, this entails that *the contexts that can be construed within Guyanese culture and my own are qualitatively distinct*. Beyond this, we also have to consider whether construing 'familiar' or 'respectful' contexts, for example, carry the same significance within the wider cultural communities. This fits in with Bernstein's claim that speakers of different codes were not able to recognise the 'meaning' of other codes (as also stated by Blommaert, 2005:4–5, above) which, following Hasan's statement that context can be read off text by *acculturated* readers, would imply that speakers of different codes belong to different cultures. While there is not room in this chapter to explore further the question of when intra-systemic variation stops and different systems start, in practical terms the result is the same: in order to read meaning off a text it is necessary to know the (sub)cultural rules in place. As a consequence, meaning cannot be read off the text unless the reader has, to some extent at least, been *acculturated* into all the systems represented. In sum, from a practical point of view, when we are analysing inter-group communication the system will by definition present itself in different states, so that we have, to all intents and purposes, two separate systems and two distinct contexts of culture (and see Urbach, this volume, for a similar discussion of diachronic differences within the same culture). This means that, as analysts in intercultural environments, we either have to become familiar with the different coding orientations in use and their relation to the wider culture or to rely on native informants to provide the necessary insights – a necessary though not unproblematic condition which

there is not room to discuss here. However, as I hope to show in Section 16.5, the level of variation involved, in terms of both the language system itself and the effects of the influencing environment, is a positive feature, both in forcing us to consider 'Why this context here and now?' and in considering the necessary conditions and the means by which existing contexts might potentially be perturbed, often in productive ways. In particular, I shall consider the possibility that superficially similar codes allow for locally significant features to be introduced into the discourse and that, under the right conditions and in conjunction with other features, these can serve as *contextualisation cues* (Gumperz, 1982), that alternative social formations are in operation and that the relative places of the two systems within the order of indexicality are, temporarily at least, reversed. In this way alternative ideologies can be *accommodated* within, or perhaps 'smuggled into', the dominant discourse.

16.5 The mind in society

The limiting case of coding variation is that of the individual. That is to say that, while aggregates of semiotic behaviour showing regular patterns enable us to talk of abstractions such as registers and (sub)cultures, and while these shared behaviours are the socialising contexts for the development of the individual system, each individual will have internalised such patterns in a unique way and from a unique network of social environments. While SFL has tended to focus on group patternings, such a notion of the individual is a central if understated part of the theory and can be found both in the works of sociologists whose ideas have influenced SFL, as with Bourdieu's notion of the *habitus* (Bourdieu, 1991:81ff.), and in SFL work itself:

> In a model of this kind, phylogenesis provides the environment for ontogenesis, which in turn provides the environment for logogenesis . . . Conversely, logogenesis provides the material (i.e., semiotic goods) for ontogenesis, which in turn provides the material for phylogenesis; in other words, texts provide the means through which individuals interact to learn the system, and it is through the heteroglossic aggregation of individual (always already social) systems that the semiotic trajectory of a culture evolves. (Martin, 1999:49)

Such an understanding of the individual (and see also Asp, 1995, for a similar definition from Gregory's Communication Linguistics approach to SFL) ultimately derives from Vygotsky's (1978) notion of the individual mind as the internalisation of social behaviour, with language as a mediating influence. Vygotsky thus talked of "the Mind in Society"; yet for some in SFL (including Martin, the above quotation notwithstanding) the 'mind' is a taboo concept. There should, however, be no problem with the term as long as we avoid a dualist conception. As Halliday says (this volume, echoed by Hasan, this volume),

"The language they [children] hear is a component in the total experience that is ongoingly shaping their minds – where 'mind' is 'individualised brain'". I have generally thought of the mind as 'the socialised brain', but this difference in terminology points to a key point: that society and the individual are really the same concept viewed from opposite perspectives. It is impossible to be an individual without having been multiply socialised; that is to say, the individuality of a mind is a consequence of the many different environments within which an individual has been socialised so that, paradoxically, *the wider the socialisation one undergoes, the more individual one becomes*. In these terms the individual semiotic system is a complex alignment of the various social systems which have shaped the individual. Returning to Bernstein's concept of codes, this means that each individual is, to a greater or lesser extent, *multicodal* and, as a result, will bring to bear on any socio-semiotic environment a variety of recognition rules and a variety of realisation rules. This will be an important point in Section 16.6.

16.6 Differences in code and culture and the perturbation potential of situation

I stated at the beginning of this chapter that my aim was to explore the conditions necessary for registers or codes that were previously restricted to specific social environments to become exploitable within a wider range of environments, so expanding the meaning potential open to actors within these environments. This takes us beyond the realms of SFL as an appliable linguistics (Halliday, 2007a; Hasan, 2009c:174–175) to its application in analysing specific instances of social activity and, as argued above, it therefore becomes necessary to combine SFL theory with ethnographically and sociologically based descriptions of the specific environment and the multiple roles of individuals within it. In this concluding section I will provide some brief examples from my own fieldwork to make some suggestions in that direction.

My fieldwork looked at development discourse between the largely Makushi population of the North Rupununi Savannahs of Guyana and the Iwokrama International Rainforest Conservation and Development Programme (hereafter Iwokrama). In particular I looked at the discourse of the bimonthly meetings of the North Rupununi District Development Board (NRDDB), and what I found suggested that, in sharp contrast to much development practice, where the institutional registers of the development organisations restrict meaningful participation from local communities (see Escobar, 1995), a 'hybrid genre' was emerging which mixed features of local discourse patterns with those of professional development organisations. In Halliday's (1992a:26) terms, this means that the system generally in operation had in some sense been

perturbed, and what was of interest to me were the social factors that created such a *perturbation potential* in the environment of the North Rupununi in contrast to similar development environments elsewhere. While a full analysis of this process is outwith the scope of the present chapter (see Bartlett, 2012), I shall give a couple of brief examples that draw on a number of the points made in the chapter and which might prove more generally 'appliable'.

My first example involves a description of Sustainable Utilisation Areas (SUAs) within the Iwokrama forest. These were, as the name suggests, areas of the Iwokrama forest where natural resources could be exploited by the local community, but only in a sustainable fashion. These areas were thus distinct from Wilderness Preserves, which were not to be exploited in any way. In explaining the SUAs to the local community, Sara, an Iwokrama worker, had largely focused on the means of organising and regulating the areas and had drawn on generalisations and abstractions (see Cloran, 2010) in her explanations. By their own admission the local communities had not followed Sara's explanation, but this changed when Uncle Henry, a local elder, provided an explanation that resonated more with local discourse styles. A key difference between the two contributions was the two speakers' construal of field, tenor and mode variables. In Uncle Henry's explanation, generally, the field of discourse changed from the organisation of the SUAs and sustainability as a scientific concept to a description of the link between the local communities and the forest and the effects of over-harvesting in the local context; the tenor changed from that of an expert talking to novices (+power, +distance) to that of a community elder to community members (+power, −distance); while the mode changed from the decontextualised abstractions typical of scientific talk to highly contextualised (see Cloran, 2010:53) talk of local life and practices. In sum, Uncle Henry's discourse style was generally similar across all the variables of register to that with which his audience was familiar from local practice, though it also brought to bear some of the features of professional development discourse (thus displaying the accommodation of codes referred to above). Two points arise from this analysis: first, that Uncle Henry had perturbed the context of the NRDDB as an institution towards community norms (or *voice*; see Bartlett, 2012); and second, that this connection between his discourse and community practice could not be read off the text alone but relied on both an understanding of local linguistic forms and an ethnographic understanding of the link between community life, in terms of material, interpersonal and rhetorical practices, and linguistic context, in terms of field, tenor and mode (and see Rose, 2001, for an extensive account of such interrelations in the Pitjantjatjara indigenous community in Australia). However, the analysis still remains limited in that it describes an example of the context being perturbed, and suggests why it might have been effective,

but does not account for how this was possible in this particular instance, nor how we might apply our analyses in fostering such perturbation in similar environments.

So, what were the conditions that (by my analysis) enabled Uncle Henry's locally based discourse to intrude into the institutional terrain of international development? First, Uncle Henry was competent in both the discourse practices of international development organisations and the local community. Second, as Uncle Henry was both a local elder and a key figure in Iwokrama, and was instrumental in establishing the NRDDB as a link between the two, he possessed the necessary *cultural capital* within each community to make his hybrid contribution *legitimate* in the eyes of both Iwokrama workers and the local audience and so to imbue his words with *symbolic capital* (Bourdieu, 1977). In this way Uncle Henry can be described as *multicodal*, rather than simply multidialectal, as his discourse was a realisation of two separate social systems.

I said above that Uncle Henry's discourse *generally* draws on community practices; however, a closer examination, which limitations of space preclude here (see Bartlett, 2012, for a fuller analysis), reveals that he switches between a voice (as an instance of a code) appropriate to his standing in the international community and a voice befitting his status as local elder. More specifically, Uncle Henry tended to configure external fields of discourse with tenor variables highlighting his distance from the community in these matters, but local fields of discourse with tenor variables emphasising both his solidarity with the community and his local authority. In both cases, however, Uncle Henry used a contextualised mode of discourse that rendered the externally derived concepts he was introducing compatible with local experience and knowledge. Uncle Henry's hybrid discourse thus demonstrates Hasan's (1995:231) point regarding the synergetic interplay of the variables of register as a *contextual configuration*.

The contextual configurations employed by Sara and Uncle Henry can be analysed to reveal the relationships between various participants in terms of their solidarity and relative authority in relation to specific fields and rhetorical modes. Authority can derive from either a speaker's social position or their knowledge, while solidarity relations can be construed through the use of pronouns, to the extent to which they signal inclusivity (WE, including the addressee), exclusivity (I/WE as opposed to YOU) or distance (HE, SHE, IT and THEY). Solidarity can also be construed through drawing of fields of shared knowledge. Authority and solidarity can therefore be combined with variables of field in different ways so that it is possible to identify complex categories of cultural capital such as local knowledge, external knowledge and the moral authority of the local elder. Moral authority, for example, can be

realised through a combination of [+control] modality, varying [+solidarity] and [−solidarity] pronominal use, and a [+solidarity] field of discourse. Of particular interest in Uncle Henry's discourse is the intermingling of relationships of high solidarity based on common cause, of distance and control based on his external knowledge and status within professional development organisations, and the moral authority of the community elder who is set apart from the rest of the community yet whose status is dependent on shared values, history and experience. These aspects of Uncle Henry's discourse demonstrate the importance of individual factors, in relation to the wider community, in facilitating perturbation. A further factor is the existence of the NRDDB as an institution that was co-founded by Iwokrama and the local communities, and in particular the housing of meetings in the community-built Bina Hill Institute – a 'space' that "becomes [a] 'place', a particular space on which senses of belonging, property rights and authority can be projected" (Blommaert, 2005:222). The sense of ownership over proceedings that Bina Hill as a setting creates within the community, as with my office in the example above, provides a potential example of the oblique relationship between environment and context that can be accounted for in terms of the 'mental models' (cf. van Dijk 2008:57ff. and Cloran, 1999:178, above) and the semiotic histories of the participants. It is also worth pointing out that Iwokrama's relatively relaxed approach to NRDDB meetings, as signalled by their casual clothes and use of informal language, in effect reduced the level of *convergent coding* and hence the institutionalisation of NRDDB meetings (Hasan, 1996d:46−47), and so rendered them more susceptible to perturbation.

While the above factors provide some plausible explanations for the perturbation potential in the particular environment of the NRDDB, they might appear ad hoc and so run counter to Hasan's (1999:238, 1995:247) call for a systematic approach equal to that of the linguistic framework provided by SFL in moving beyond the parameters of context and into environmental factors. Such a model does not come about fully formed, however, but develops from the interplay of theory and practice. From my own applications of the SFL concept of context in and for the particular goals of my research, I have developed the rudimentary heuristic model of the factors involved in accounting for perturbation potential shown in Figure 16.4, a model which itself contains much potential for refinement.

The model is based on Harré and van Langenhove's (e.g. 1999) Positioning Triangle as developed within Positioning Theory, an approach to social psychology. In Harré and van Langenhove's model, a speaker/actor is said to take up a position through their acts (not necessarily intentionally) and against a storyline, with the acts then feeding back into the storyline (hence the bidirectional arrows). Such a framework seems largely compatible with SFL theory,

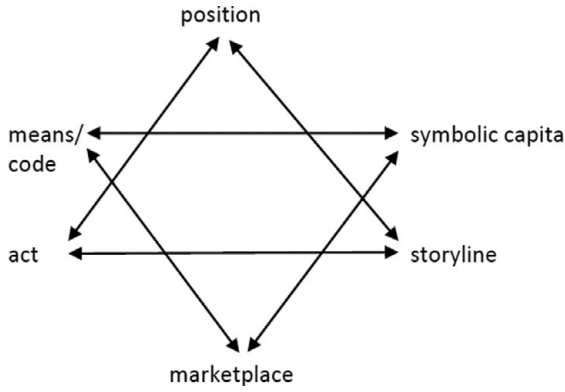

Figure 16.4. 'Positioning Star of David'

but does, however, rather like Chomsky's idealised speaker/hearer, suggest that there are no constraints in place and that the speaker/actor is free to take up any position they choose. In these terms the model might be useful in describing data such as mine, but it would fail to provide adequate explanation as to the conditions in which such positioning is effective, or indeed likely to come about. For that reason I have added, drawing on Bourdieu (1977, 1991), Bernstein (2000) and SFL theory, a condition between the different nodes of the original model to suggest that in order to successfully take up a position a speaker/actor needs to have access to the appropriate symbolic capital within the existing storyline; that in order to realise this position in speech/action they must have control over the appropriate code; and that the act needs to be validated within a specific discourse context (or linguistic marketplace). Analysing speech acts in terms of registerial variables adds complexity to the model, as the contextual configuration is an important factor. In the example above, for instance, Uncle Henry switched the field and tenor of discourse in conjunction, aligning the appropriate tenor to the different fields as a function of the type of symbolic capital he possessed within each respectively in that specific linguistic marketplace as determined by the context(s) of culture of which it is an instance.

Returning to Halliday's model of language development and the change from disjunctive to simultaneous options in the system, we can consider the effects of interventions such as Uncle Henry's on future discourse. Halliday (2005a:57) talks of the evolution to simultaneous options in statistical rather than absolute terms. Whereas a disjunctive option means that the two options never co-occur, a simultaneous option does not mean that all traces of dependency have disappeared, with conjunctions better stated in terms of probabilities. So, for

example, while the passive can now be used with all tenses in English, there will still be a marked preference for its use with simple rather than compound tenses, a correlation that is likely to reduce over time as the 'novel' usage becomes more familiar. A similar effect can be seen at the contextual level in my fieldwork. As suggested above, one effect of Uncle Henry's use of local discourse features was to contextualise the explanation of the SUAs in terms of community life. His discourse, therefore, made the process more *understandable* to the local community not only in terms of *comprehension* but also of *empathy*. Talking of the lack of local input into meetings, Walter, the Chair of the NRDDB at the time of my fieldwork, had said to me "Why they don't contribute is because they don't understand". In facilitating understanding, therefore, Uncle Henry had increased the potential for other speakers from the community to contribute to the discourse. Not only that, but as an influential member of both the local and the development communities, in using local discourse in the institutional environment Uncle Henry had set a valuable precedent, legitimating such usage from other participants – what Halliday (2005a:61) calls the 'Hamlet Effect' – in extending the simultaneous use of previously disjunctive features. An interesting parallel can be drawn here with Bernstein's concepts of *voice* and *message*. For Bernstein (2000:5–14), *voice* represents the institutional constraints on the contents of discourse, the limits on what can legitimately be put together, while *message* refers to the means by which voice is realised, or *framed*, in individual language acts.[9] Importantly, there is variation in the relationship between voice and message such that a single dominant voice can be framed in different ways in different environments. So, for example, it could be said that in explaining the SUAs, a concept emanating from Iwokrama as an international development agency, Uncle Henry was merely reinforcing the existing dominant voice through the use of local messages as the means of framing the discourse within permissible limits. However, Bernstein (2000:15) goes on to say that the means of framing can in time weaken and ultimately break down the classifications imposed by the dominant voice. In the terms discussed here, that would mean that local forms of discourse, as they become more prominent within institutional contexts, come to represent the basis of the discourse rather than just a means of enabling external discourses – a move representing the *appropriation* of the institutional environment by the local context of culture.

Let me finish with a further brief example from the NRDDB that is suggestive of such a development. In example (1) Walter (W) is the Chair of the NRDDB, Hilda (H) is a representative of Iwokrama, and Sam (S) is a past Chair. Chairs of the NRDDB are always members of the local community:

[9] For a discussion of the parallels between Bernstein's and Hymes's conceptions of *voice* and my gloss of it, above, as 'an instance of code', see Bartlett (2012: Chapter 1).

Example (1)

1	H:	Erm, is there a (xx) in the SUA=
2	W:	=I would like=
3	H:	=I mean this=
4	W:	((quietly)) Miss Hilda, can we have, erm, Mr Bramley . . . first?
5		(2s)
6	S:	Yes, thank-you, sir!
7		((Sam speaks for 2m 10s))
8		That is what I would like to see happening here. (xx). Thank-you.
9		(2s)
10	W:	Going to say something, Hilda?
11	H:	Yes, Chairman, just to respond to er Mr Nicholas's comment.

We see here a short struggle for control over proceedings of the meeting. This extract begins with Hilda interrupting proceedings, as all Iwokrama representatives are prone to do, drawing on informal interpersonal styles that serve to deemphasise differences in cultural capital between professionals and local groups. Such moves in general decrease the degree of institutionalisation in NRRDB meetings, but in this instance Walter exploits the tensions within the environment to foreground *alternative* institutional conventions. He responds by asserting his authority over Hilda, despite her position as an important member of Iwokrama, addressing her as "Miss Hilda" (4), a local usage (discussed above) combining formality and solidarity, and politely requesting that Sam, who he refers to as "Mr Bramley" (4) although he is a close friend and community member, be allowed to speak next. What Walter appears to be doing through this use of titles, as a feature of tenor, is to suggest that it is the institutional relations of the NRDDB that are in play here, not the more familiar relations that might be appropriate in other contexts, including the designed informality of Iwokrama-led meetings. After Walter's intervention, Sam, who is renowned for mixing business with laughter, apparently recognises the face-threatening dynamics at play and is able to make light of the situation by severely downplaying his own authority, related as it is to Walter's and in opposition to Hilda's at this point (6). When Sam has finished, Walter recognises Hilda's right to speak and reaffirms his solidarity and friendship by using her first name only (10). When Hilda responds by referring to Walter by his official title and to Nicholas as "Mr Nicholas" (11), she would appear not to be shunning this peace token, but acknowledging her position as under the authority of the NRDDB as an institution at this point. In terms of the Positioning Star of David model, presented in Figure 16.4, what Walter has done is to draw on a tenor variable that correlates specifically with the NRDDB as a 'marketplace' in which he controls significant cultural capital (and one that

relates to markedly different interpersonal relationships from those operating systematically in wider Guyanese culture) in order to control the field of discourse and in so doing to legitimate Sam's contribution over Hilda's. Walter's use of address forms therefore serves as a contextualisation cue that different *orders of indexicality* are in operation within the NRDDB, with the hybrid code of the NRDDB now top of the pecking order. This level of control contrasts with Walter's earlier performances as Chair (see Bartlett, 2012) and was part of a wider pattern of the growing *localisation* of NRDDB discourse, a process that could reasonably be assumed to have been facilitated through the incremental 'Hamlet Effect' of individual 'perturbations' such as Uncle Henry's, discussed above.

16.7 Conclusion

The goal of this chapter has been to consider the range of factors necessary for alternative discourses to become legitimated within social environments from which they had previously been excluded, so increasing the meaning potential within these environments. I suggested that in order to account for this *perturbation potential*, three theoretical moves are necessary. First, it is necessary to distinguish between the variables of the environment and those of the context of situation in order to identify both the active and silent contexts within the environment as a context potential, the wider social significance of these, and the interplay between them. However, such relations between the environment and the context may often be oblique, and it is therefore necessary to follow the lead of Foucault (1984:76), who advocates a broad examination of the conditions of possibility within a particular social context through a *genealogical* approach which:

> . . . must record the singularity of events outside of any monotonous finality; it must seek them in the most unpromising places, in what we tend to feel is without history – in sentiments, love, conscience, instincts; it must be sensitive to their recurrence, not in order to trace the gradual curve of their evolution, but to isolate the different scenes where they engaged in different roles.

In similar vein, Scollon and Wong Scollon (2007:621) talk of the need "to document or record everything that might be relevant to understanding the historical antecedents of a social action as well as the unfolding outcomes of that action".

Second, the various codes in play need to be described in their own terms as each relates language to society in a locally specific way (as with Walter's use of titles), what Blommaert (2005:70) calls their *relativity of function*. While such differences might well be inherent across all contexts, Blommaert (2005:72) emphasises the increased importance of this concept within the context of

globalisation, into which category my case study falls. In a more positive light, I have suggested that different codes have the potential to activate previously 'silent' contexts, such as the social systems of either Makushi culture or the NRDDB as an institution, and to raise the position of these in the prevailing order of indexicality.

And third, it is necessary to account for individuals and the range of knowledge, codes and cultural capitals that they control and can bring to bear on the context as a result of their semiotic histories within the context(s) of culture (as with Uncle Henry's dual status as local elder and prominent participant in external discourses of development).

Each context carries a degree of *perturbation potential*, the scope for altering accepted, often hegemonic, discourse practices, in direct relation to the different voices of the participants present, their place in the communities that they represent, and their capacity to act on these conditions as determined both by the structural constraints of the social context and the speakers' individual skills. For me, then, the task of Positive Discourse Analysis (Martin, 2004), rather than celebrating alternative discourses without relating them to the social bases of their formulation and their potential for uptake, is to bring to light the perturbation potential in each context and to stimulate this potential in practice. This entails moving beyond SFL as an appliable theory and drawing on other frameworks in order to apply the theory in practice. The important entailment in that last sentence, however, is that the frameworks developed are consistent with SFL's understanding of context as an active construct and of the relationship between language and culture. As a result of my own applications of SFL in practice I have suggested the Positioning Star of David as one means of approaching linguistic and ethnographic data, but there is much work still to be done in the borderlands where context and environment meet.

17 Towards a study of the differences between formal written English and informal spoken English

Margaret Berry

17.1 Introduction

This chapter is written from the perspective of an applied text linguist.[1] It will report on part of an investigation which hopes to provide information which will be helpful to teachers of English. Halliday's Systemic Functional Linguistics (henceforth SFL) is particularly suitable for such a study. The notion of Choice is especially relevant; teachers see themselves as extending the range of choices open to their students and welcome information on the options available. Teachers are particularly interested in choices of meanings; Halliday's view of language as "a resource for making meaning" (Halliday, this volume) is one to which they can readily relate. Teachers are also concerned to help their students to make the choices appropriately; SFL work on context and register is clearly relevant here. (For more on the suitability of SFL for meeting the needs of teachers, see Berry, 1996:1–11.)

The general purpose of my long-term investigation is to gain a greater understanding of the differences between the informal spoken English that children grow up with and the formal English they will need to learn to write in order to succeed in various careers. What choices most distinguish these registers? Do the options in meaning that seem to lead to success in informal spoken contexts differ from those that seem to lead to success in formal written contexts? Do the formal written contexts differ among themselves from the point of view of the meaning options that seem to be preferred?

I should admit immediately, however, that I shall not be getting far with my long-term aims in the present chapter. The purpose of the present volume is 'to theorise Choice'. I shall first attempt to theorise Choice and methods of studying Choice in general terms (Sections 17.2 and 17.3), and then discuss

[1] I am grateful to Chris Butler, Ben Clarke, Ruqaiya Hasan, Hilary Hillier and the editors of this volume for discussing with me relevant issues even before the chapter reached first draft stage. I am also grateful to those who read the first draft and provided helpful comments: the editors, Chris Butler and Hilary Hillier again, also Geoff Thompson. Of course, I alone am responsible for any errors or misrepresentations.

how to theorise a few of the choices that are emerging from my long-term study (Section 17.4). The present chapter is on the theoretical background to my long-term study, rather than on the long-term study itself.

17.2 The notion of choice

When discussing the notion of choice, a number of questions arise. The most important of these seem to be: Do the choices simply comprise an inventory of options available in a language, or do humans actually make these choices? If humans make the choices, do they do so consciously or unconsciously? Are the choices free or constrained? Are they collective or individual? Are they choices of meaning or choices of form or choices of context? Are choices of meaning contextually determined or do they determine the context?

Questions also arise as to how we should study choices: Should we be concerned with **what** choices to include or with **how** the choices are made? Should we study choices as product or as process? Should our approach be descriptive or prescriptive? Should we be engaging in large computer-based studies or in small manual analyses? What part should system networks play in our studies?

I will consider each of these questions in turn. In most cases I shall conclude that it is not really a matter of either/or, but a matter of both/and. Can one not have different perspectives on choice, depending on the purpose of one's study?

17.2.1 Do the choices simply comprise an inventory of options available in a language, or do humans actually make these choices?

Are we talking about choices in general, or specifically about those represented in the SFL literature, for instance those implied in Halliday's *Introduction to Functional Grammar* (1994a) and made more explicit in Halliday and Matthiessen (2004)? For the moment I will focus on the latter.

The notion of **choice** first came to prominence in SFL with Halliday's (1963) paper 'Class in Relation to the Axes of Chain and Choice in Language' (2002b), where *choice* was simply an alternative, more reader-friendly term for the paradigmatic axis, just as *chain* was an alternative, more reader-friendly term for the syntagmatic axis. (The word *choice* occurred in Halliday (1961) (2002a), but was not given particular prominence there.) Soon after that (Halliday, 1966), paradigmatic relations, choice relations, began to take precedence over syntagmatic relations.[2] The paradigmatic relations were the underlying form of representation, the fundamental base, while the syntagmatic relations, the structures, were derived from them via realisation statements. This was

[2] For discussion of syntagmatic and paradigmatic relations, see Halliday (this volume).

one of Halliday's great innovations in linguistics and it is still the case that SFL pays more attention to paradigmatic relations than any other approach to linguistics.

By 1978, choice was the organising principle for a grammar. A language was a set of resources, these resources consisting of choices available in the language, the choices making up the potential of the language, each choice being represented by a system in a network of systems:

> . . . the semantic system is a network of meaning potential. The network consists very simply of a set of interrelated systems . . . a system is a set of options, a set of possibilities . . . Hence, a semantic network is a representation of semantic options, or choices in meaning. (Halliday, 1978b:40–41)

More recently the same view prevails:

> The system network is a theory about language as a resource for making meaning. Each system in the network represents a choice: not a conscious decision made in real time but a set of possible alternatives. (Halliday, 1994a:xxvi)

and more recently still:

> . . . each system – each moment of choice – contributes to the formation of the structure. Of course, there is no suggestion here of **conscious** choice; the 'moments' are analytic steps in the grammar's construal of meaning. (bold as in original) (Halliday & Matthiessen, 2004:24)

It seems clear that, for Halliday, and indeed Matthiessen, the choices primarily constitute an inventory of the resources of a language, rather than choices actually made by humans. However, it is interesting to note that in the last two quotations above, although **conscious** choices by humans are ruled out, this is not necessarily the case for unconscious choices. This becomes even clearer in the following quotation:

> . . . the categories of our language represent unconscious rather than conscious slices of meaning; . . . (Halliday, 1994a:xxv)

Certainly, as an applied linguist, I would want to be interested **both** in the choices which constitute the resources of the language with which I am concerned, English, **and** in the choices that humans actually make from among these resources. Halliday would seem to encourage this view. Speaking of the two areas of language and education, and language and literature, he says:

> They make it necessary to be interested in what the speaker does; in the *text*. Now in order to make sense of 'what the speaker does', you have to be able to embed this in the context of 'what the speaker can do'. You've got to see the text as an actualized potential; . . . (italics as in original) (Halliday, 1978b:57)

An applied linguist does indeed need to know both about the resources, what the speaker/writer can do, and about what the speaker/writer does, about the choices that the speaker/writer actually makes.

At the beginning of this subsection, I left open the question of whether there were other choices, besides those discussed in the SFL literature. As far as I am aware, Halliday has never claimed that his account of the choices of English is an exhaustive account. How does one know what to include in an account of the potential of a language? How does one know what choices are made by humans?

It seems to me that this is where text analysis comes in. If one finds that the texts one is analysing differ, it seems reasonable to infer that the humans concerned have made choices, that there were options which have been chosen between. If there were not, all the texts would be the same. (Whether the choices were conscious or unconscious will be discussed in Section 17.2.2.) Through linguistic analysis of the differences between the texts, one can work out what those choices were, what the options were that were available for choosing. One cannot by this method deduce **how** the choices were made, by what mental processes. But one should surely be able to work out by this comparative text analysis **what** choices have been made, between **what** options.[3]

If these choices have been made by the human producers of the texts analysed, the options must presumably be among the available options in the language's potential. Comparative text analysis can thus provide evidence both for the choices made by particular humans and for the choices to be included in an account of the potential of their language.

It is possible that even a small study may reveal differences which suggest choices not hitherto discussed in the SFL literature. It is also possible that a small study may lead one to question very tentatively the current priorities. Are the choices most frequently discussed in the SFL literature the choices most frequently made by humans as evidenced by the texts? A small study could only lead to very tentative questioning of this kind. It would need many, much larger studies, before one could overturn the current priorities. I would suggest that any account of the potential of a language should remain hypothetical until it has been tested against vast amounts of data.

17.2.2 If humans make the choices, do they do so consciously or unconsciously?

I suggested (Berry, 1975:52–54) that there was a cline of consciousness, ranging from fully subconscious to fully conscious. In all probability the majority of linguistic choices made by humans are at or near the fully subconscious end of

[3] By *text* I mean a language event as recorded in either speech or writing.

the scale. At the other end of the scale, probably only an SFL linguist would make linguistic choices so fully consciously that she would be able to be explicit about the choices she was making.

However, literary writers must surely be at least semiconscious of the choices they make. And teachers who wish to extend the range of their students' choices and help them to make the choices appropriately, as described in the first paragraph of this chapter, are presumably encouraging the students to make the choices consciously. One method of doing this would be to look at a text which a student had produced by making subconscious choices, discuss with the student other options that the student might have chosen, then encourage the student to revise her text, this time making choices consciously.

Indeed, the process of revising a text does not just apply to students. Anyone who goes back over a text she has produced and revises it is probably making choices at least semiconsciously. This probably applies more to writers than to speakers. But speakers do often start to say something, then stop and start again to say it in a different way. This suggests that some at least semiconscious choosing is going on.

In my study I am working on texts which have probably for the most part been produced by choices at or near the subconscious end of the scale. But I am doing so in order to shed light on more conscious choices and to enable teachers to intervene in such a way as to raise students' consciousness of the choices they make.

17.2.3 Are the choices free or constrained?

I also suggested (Berry, 1975:52–54) that there was a cline of degrees of freedom of choice. There are probably no extreme ends of this scale, however. One is never totally free or totally constrained. What might constrain one? The context of situation? The context of culture? The existing resources of the language? These may strongly influence human choice, but it is always open to human choosers to do something outrageous with their language, for humour, as a sign of rebellion, or for literary purposes. It is always possible to use language in a way that would be regarded as inappropriate to the context, in order to shock. And if the existing resources of the language do not meet one's needs, one can coin new words and phrases, as Milton did with *pandemonium* and Lewis Carroll with *galumphing* and *chortled*. e.e.cummings even invented new grammatical constructions, as in *anyone lived in a pretty how town*. Is one ever totally free? Probably not, if one wants to be understood and/or accepted by one's fellow humans. e.e.cummings may have used strange grammatical constructions in this poem, but his vocabulary for the most part is fairly everyday.

Bartlett (this volume) and Urbach (this volume) discuss social and situational constraints on choice. However, Bartlett also shows how 'Uncle Henry', in a Guyanan situation, overcame the constraints.

17.2.4 Are the choices collective or individual?

Answers to this question depend on the perspective from which language is being viewed. I am myself interested in the choices that individual humans make, whether conscious or subconscious, when they produce texts. However, I want to consider these individual choices in relation to the choices which are usually made in the relevant contexts. In this sense I am viewing the individual in the light of the collective. My long-term research is an attempt to find out what choices are usually made in informal spoken contexts and in formal written contexts, so my emphasis in this is on the collective, but it is with the aim eventually of being able to inform discussions of the choices of individuals.

Halliday and Matthiessen seem to suggest that both collective and individual are important also with regard to the choices that humans make when construing their experience of the world:

> . . . we have tried to represent language as the resource whereby **the human species, and each individual member of that species**, constructs the functioning mental map of their phenomenal world: . . . (emphasis added) (Halliday & Matthiessen, 1999:ix)

However, if one is concerned with how a language comes to be the way it is, with how its resources have been built up, with how it changes, maybe the collective takes precedence. Butt, Moore and Tuckwell (this volume) say:

> The unconscious performance of individual instances of behaviour; the implicit, latent patterns that realise our systems of meaning; and the little chartered but immense complexity of a language (with its many levels of realisation), all resonate with the view that languages are like 'species of behaviour' – **a collectivity**, passed on from generation to generation, which sustains itself through myriad, minor variations with adaptive potential. (emphasis added)

Citing Darwin, Butt *et al*. consider whether humans can be said to choose. I would argue that humans **do** choose; they make choices (whether conscious or subconscious) when they produce texts. But individual humans cannot choose how their language is going to develop, which new words, phrases, grammatical constructions or metaphors are going to enter the resources of the language and become established in the language. That can only result from collective choices over time.

Individual choices are not entirely irrelevant to language development, however. Halliday and Matthiessen write of:

> . . . meaning as a potential, a systemic resource which is deployed in – **and ongoingly modified by – individual acts of meaning in language**. (emphasis added) (Halliday & Matthiessen, 1999:x)

Someone has to use a new word, a new phrase, a new construction, a new metaphor for the first time, even if that person has no control over whether it is going to be used by others and so become established in the language.

I said above (Section 17.2.1) that comparative text analysis could provide evidence for the choices to be included in an account of the potential of a language. It is necessary to distinguish here between idiosyncratic, one-off choices and regular choices indicated by systematic differences between texts. I would not want to include something in the potential of a language simply on the basis of one person having chosen it. There would need to be evidence that it had become established in the language through collective choices. *Pandemonium*, *galumph* and *chortle* have made it into English and now appear in English dictionaries, but as far as I am aware the grammatical constructions of e.e.cummings have not caught on.

17.2.5 Are the choices choices of meaning?

In the days of Halliday's (1963) 'Class in Relation to the Axes of Chain and Choice in Language' (2000b), the choices discussed were mainly formal choices, but it now seems to be generally agreed in SFL that the most important choices in the potential of a language are choices of meaning. See, for example, the quotations above from Halliday (1978b:40–41, 1994a:xxvi), and Halliday and Matthiessen (1999:x). Also, representing the Cardiff branch of SFL:

> . . . in a modern SF grammar the system networks model choices between **meanings**. And it is these that are seen as the generative base of the grammar. (bold as in original) (Fawcett, 2000:43)[4]

What is not generally agreed, however, is what choices count as choices of meaning. Are the choices implied by Halliday (1994a), and made more explicit in Halliday and Matthiessen (2004), choices of meaning? Or is there some higher level of language where the meaning choices are situated?

There is unfortunately not room in the present chapter to debate this issue fully. Much more detailed discussion can be found in Butler (1985: esp. 77–81), Fawcett (2000: esp. 53–60), Butler (2002: esp. 65–67) and Butler (2003: esp. 178–184).

Briefly, as Fawcett notes (2000:49), when, in the late 1960s and early 1970s, Halliday first began discussing the choices implied by his *Introduction to Functional Grammar* (1994a), choices such as those of Transitivity, Mood and

[4] Page references here are to the (2000) edition of Fawcett's book.

Theme, both he (Fawcett, 1981) and I (Berry, 1975: Chapter 8), among others, interpreted Halliday as intending that these choices should be regarded as meaning choices and that they constituted the semantics of a language. Halliday has since made statements that seem to support this view. For instance, in the introduction to *Introduction to Functional Grammar* (1994a:xix), he writes of the grammar being "pushed in the direction of the semantics".

However, elsewhere, Halliday and his collaborator Matthiessen (e.g. Matthiessen, 1995; Halliday & Matthiessen, 1999) seem to assume that there is a higher level of language which constitutes the semantics and where the meaning choices are to be found. Other linguists such as Hasan (2009a) and Martin (1992) have developed networks of choices which might be regarded as, at least in part, representing this higher level.

Could it be that **both** the Transitivity etc. choices **and** the choices of the higher networks might be regarded as meaning choices, so that we have two levels of semantics? Fawcett (2000: 57) comments that the "new level of meaning is an unnecessary complication to the theory".

Fawcett himself attempts to get the best of both worlds in a rather different way. He notes (2000: 50) that while Halliday has succeeded in pushing the Transitivity network towards the semantics, he has not done the same for Mood. Fawcett's own approach is to accept from the work of Halliday and Matthiessen those choices which have been fully semanticised, such as Transitivity choices, but to supplement them with versions of choices such as those of Mood which are more semantic than those of Halliday, welding them all into a single level of semantics containing all the choices of meaning.[5]

The most important question is: How does one choose between the various possibilities? How do I choose the model I am going to work with in my long-term study? I would suggest that there are four considerations:

1. If one is interested in meaning, then presumably one wants the choices one is considering to be as semantic as possible. Furthermore, one wants to include all types of choices of meaning. Another of Halliday's great innovations in linguistics is the recognition that, as well as experiential meaning, interpersonal meaning, textual meaning and logical meaning are important to the users of language.[6]
2. I assume that it is desirable for a theory to be as simple as is consistent with accounting for the data the theory is intended to account for. If one version of the theory assumes one level of choices where another version assumes two, the one-level version is preferable, provided that it does indeed account

[5] Fawcett (forthcoming b: 186) says "... the Cardiff network for MOOD covers essentially the same range of options as the equivalent semantic system network of Hasan (e.g. Hasan and Cloran 1990, Hasan 1992)...".

[6] See e.g. Halliday and Matthiessen (2004:29–31) for discussion. Also see Halliday (this volume, esp. Section 1.6).

for the data. It is particularly important to keep one's theory as simple as possible if one hopes that it will be useful to teachers in the classroom.

3. To fully account for the data, the theory would need not only to identify the relevant choices but would also need to specify the circumstances under which the choices were made.
4. It would also need to show how the choices fitted into the theory as a whole; in particular it would need to show how the choices were realised.

These considerations raise the whole question of accountability. What is SFL theory accountable to? What data is it intended to account for? This is not always clear.

Fawcett and his Cardiff colleagues do seem to be clear what their theory is accountable to – to the need to generate, via the computer, text which is as close as possible to naturally occurring text. Any failure is immediately noticeable and can be remedied. As Fawcett himself says (2000:5): "every little flaw in the implementation can immediately be noticed by any user of the language."

As a text linguist I would want my theory to be accountable to texts. It is important to emphasise in this connection that if one wants to cite text analysis as evidence for choices, the study must include **comparative** text analysis. One cannot use text analysis as evidence if all one has done is take one homogeneous text and impose an analysis on it. Indeed, it is not sufficient to take several texts and impose analyses on them, if one has not drawn out the differences between them. It is **differences** between texts, or between sections of texts, that enable one to infer that choices have been made and to work out linguistically what those choices must have been. As I suggested above (Section 17.2.4), if the differences turn out to be regular, as opposed to idiosyncratic, differences, they can be used as evidence to support the inclusion of the choices in an account of the potential of the language.

For the moment I shall assume with Fawcett that meaning choices are central to my study, that there is one level of such meaning choices, that these include the Transitivity choices of Halliday and Matthiessen, representing the experiential metafunction, but that these will need to be supplemented by semanticised versions of the choices representing the other metafunctions. Of course my starting theoretical position may need to be modified in the light of any problems I encounter.

17.2.6 Are there choices of form?

Are there choices of **form**? Again, there will be no room in this chapter to debate this issue fully. I have just said that I shall be following Fawcett's line with regard to what count as meaning choices. Indeed it is my line too (Berry, 1975, 1977). I shall be following Fawcett's line also with regard to the level of

form – unless and until I find ways in which this does not enable me to account adequately for the differences between my texts.

Fawcett acknowledges (2000:42–43) that "it is incontestable that there are relations of contrast at the level of **form**" (bold as in original), but he does not want to regard these as choices, because they follow from and are determined by the choices in meaning.

> For example, if two outputs from the grammar display a contrast in form, as between *that student* and *those students*, the importance of the contrast is that the two forms express a contrast in meaning which the Performer wishes to communicate to the Addressee. In other words, the difference between 'singular' and 'plural' is ultimately a difference of meaning rather than form. (Fawcett 2000:43)

However, Fawcett adds at the end of this quotation, "But there is, of course, no meaning without form". One may not wish to recognise choices at the level of form, but this does not mean that form is irrelevant to the notion of choice. It is through form that the meaning choices are realised.

As well as a meaning potential for a language, Fawcett also recognises a **form potential** (2000:40). This consists of the **realisation rules**. Fawcett emphasises (pp. 64–69) that it is important that an SFL model of language should have a separate component for the realisation rules.

A particularly important point that Fawcett makes is that SFL still needs a level of form such as that which was described in Halliday's (1961) paper 'Categories of the Theory of Grammar' (2002a). This is something else over which I have always agreed with Fawcett. Indeed in the 1970s I resisted pressure (Berry, 1975: Chapters 5, 6 and 7) to abandon a 'Categories' type account of the level of form, even though by then it was beginning to be regarded as out of date. It was and is my view that such an account is still needed.

From a theoretical-generative point of view, this level of form, which Fawcett now calls **syntax**, is needed in order to provide the final syntactic stage in the generative process. As an applied text linguist, I need it also for a different reason. If one is to adopt the procedure suggested in Section 17.2.2 of examining a text to see what meaning choices have been made, discussing what options might have been chosen, then revising the text in the light of the discussion, one needs to know not only how the various meaning options are realised, but also **where** to look for the realisations. An account of the 'surface' syntactic structure provides a kind of map on which one can relatively easily indicate the locations where various meaning choices become available.[7]

In his (2000) book, Fawcett starts from the 'Categories' account but develops it into an account suitable for modern SFL.

[7] Fawcett (2000:3) discusses the difference between his use of the term *syntax* and Halliday's use. He also (pp. 47–48) discusses Halliday's use of the terms 'surface' and 'deep'.

I shall assume with Fawcett, then, that networks of choices at the level of form are both unnecessary and inappropriate, but that realisation rules and an account of 'surface' syntactic structure are essential accompaniments to the networks of choices of meaning.

17.2.7 Are there choices of context?

I have just agreed with Fawcett that networks of choices at the level of form are unnecessary. Do I need to recognise choices of **context**? Yes, I think I do. I said in the opening paragraph of this chapter that teachers wanted to help their students to make choices appropriately. Appropriately presumably means appropriately in relation to context. If one is to make choices appropriate to the context, one first has to make decisions, consciously or subconsciously, about what kind of context one is in. It is also possible to make choices about what kind of context one wants to be in, as I shall discuss in Section 17.2.8.

First, are networks of choices for context available? Hasan (e.g. 1999) has produced such networks, as also has Martin (1992).

Hasan adopts (1999:232) "the SFL view of relevant context as a theoretical construct with three variables: . . . *field of discourse* . . . , *tenor of discourse* . . . , and *mode of discourse* . . . ". She traces the history of this view, but gives her own glosses for the three variables. Field of discourse is "the nature of social activity relevant to speaking", tenor of discourse is "the nature of social relation relevant to speaking" and mode of discourse is "the nature of contact for the conduct of speaking". These glosses seem to me to be clearer than earlier glosses, particularly the gloss for mode, so hopefully they will be easier to work with.

Hasan refers to this tripartite structure as the *contextual construct*. The particular values of field, tenor and mode which are relevant to a specific instance of speaking or writing form a *contextual configuration*, with CC used as an acronym for this. Hasan comments:

> Since language in use realises some given CC, any variation in CC will naturally activate some variation in this language; it is this kind of variation that in SFL we refer to as *register variation*. (italics, throughout this summary of Hasan's approach, as in original) (Hasan, 1999:232)

In the (1999) paper, Hasan provides networks of systems only for field. However, choices for tenor and mode are inferable from Hasan's comparative tables (e.g. p. 244), and both Cloran (1987) and Bowcher (1999) include a Hasan network for tenor.

Hasan also makes challenging observations about context in general, which I shall discuss in Section 17.2.8.

17.2.8 Are the choices of meaning contextually determined or do they determine the context?

Hasan (1999:221) challenges the view that context "is *always already there* even before any speaking has been done". She acknowledges that there is some truth in this but recognises also "the power of language to create context". Presumably then it is necessary to distinguish between the features of a CC that **are** "already there" and features that a speaker or writer wishes to create, thus changing the starting CC into a rather different CC. The speaker or writer would have to both recognise (consciously or subconsciously) the already there features and also make choices about the CC to be created.[8]

Some features would seem to be more changeable than others. Features of mode often seem to be already there. For instance, if one is taking a written examination, then the situation is a written language situation and there is not much one can do about it. One cannot start to speak without risking being immediately ejected from the examination room. (Except possibly *sotto voce* to the invigilator.) In an oral examination, on the other hand, one would not get many marks if one insisted on writing everything down instead of speaking it. Features of tenor on the other hand seem to be more malleable. As O'Donnell (1999:92) points out, if the starting CC includes the feature of near maximum social distance between the interactants, it is possible for one of the interactants to attempt to decrease the social distance by using language more associated with a lesser social distance.

In certain types of situation, notably face-to-face situations, the context can in fact be negotiated, making the CC a joint creation of the interactants. Hasan (1981), Cloran (1987), Bowcher (1999) and O'Donnell (1999) all recognise this and discuss the situations in which such negotiation is likely or unlikely to take place. O'Donnell points out that such negotiation may not always be amicable and co-operative.

It is clear that in a spoken, face-to-face situation an interactant cannot afford to ignore the contextual views of his interlocutor. I would suggest that this is also true for written language. In fact it could be said that the art of good writing is to successfully anticipate the CC as perceived by one's reader(s). In Berry

[8] Hasan's networks relate to the contexts created by language. However, they provide clues to the features of situations that are 'already there' and I shall be using them in this way. For the rest of this chapter, I shall use the term *situation* to refer to what is 'already there'. I shall use the term *context* to refer to what speakers and writers make of the situation, both by the features of the situation they recognise as relevant and by the choices they make about what features to try to change. This seems to correspond, at least roughly, to Hasan's (e.g. 2009c:177ff.) distinction between *material environment* and *relevant context*, though Hasan seems to be writing from the point of view of the analyst, rather than trying to work out as I am what decisions speakers and writers themselves have to make.

(in preparation) I discuss what happens when a letter-writer's perception of the CC does not match the CC as perceived by the intended recipient of the letter.

As regards the question at the head of this section, it would seem that nothing determines anything, though it might strongly influence it. The features of a CC may set up expectations of particular meaning choices, but it is always possible for speakers and writers to go against those expectations. And one may make meaning choices in the hope of creating a context with a particular CC, but the changes one envisages may be resisted by one's interlocutors. All of which makes the notion of choice much more exciting and much more relevant to real people than a view which assumes that humans are at the mercy of things being determined by other things.

17.3 Approaches to the study of choices

So much for questions relating to the nature of choices. There are also questions with regard to approaches to the study of choices.

17.3.1 Should we be concerned with WHAT choices to include or with HOW the choices are made?

As so often, I would want to say 'Both'. I am sure that teachers would be just as interested in information about the mental processes involved in making choices as in information about what choices might be expected in what contexts. However, studying mental processes probably involves a different kind of expertise from the kind that is involved in analysing texts. I can see how I as a text linguist can provide information about what choices, but I cannot see how I could directly contribute to the study of the mental processes involved. That is probably the domain of the psycholinguist or neurolinguist.

17.3.2 Should we study choices as product or as process?

This question is of course closely related to the previous question. However, there may be ways of studying the processes of choosing which do not directly involve studying what happens in the human mind. In spoken language, hesitations, slips of the tongue and self-corrections, and in written language, crossings-out may provide clues to the processes. O'Donnell (this volume) discusses a method of recording the keystrokes of authors in writing and revising texts.

I would still maintain, however, that analysing texts, which is what is usually meant by studying choices as product, is valuable, as well as attempts to study choice as process. At the risk of repeating myself, analysing texts can show

what choices have been made, in what contexts, even if it cannot show by what mental processes or in what order.

Teich (this volume) proposes a threefold distinction: studying choice as system; studying choice as process; studying choice as product. I would argue that studying choice as product can actually contribute to the other two. By discovering what choices have been made by the producers of particular texts, one can provide evidence for the choices available in the language system as a whole, for the choices to be included in an account of the language potential. And assessing one's text as product plays an important part in the process of revising the text. As I suggested above, one of the things that teachers may do is encourage students to consider what options they have chosen in their texts and what options they might have chosen before going on to revise the texts in the light of the discussion.[9]

17.3.3 Should our approach be descriptive or prescriptive?

As a linguist, it is my job to give a descriptive account of what choices are made in what contexts. I would also wish to give an account of which options seemed to be most successful in which contexts, the degree of success to be judged by the participants and/or informants.[10]

Teachers making use of the information I provide would probably want to extend the range of options open to more advanced students through discussion rather than through prescription. But teachers of less advanced students might well want to prescribe. As O'Donnell commented in a recent Sysfling debate, "Most language learners want clear and simple rules, at least at lower levels".[11]

Once students were aware of the norms, they would be free to go against the norms. But going against a norm because one has chosen to do so is a very different matter from going against a norm because one does not know what the norm is.

17.3.4 Should we be engaging in large computer-based studies or in small manual analyses?

Again, 'Both'. Large computer-based studies are needed if one wants to fully test one's hypotheses. But small manual analyses can also play their part.

With a small manual analysis, it is usually possible to find out more about the context and more about the interactants, to get closer to the language event one is analysing, than is possible in a large study. And with a large computer-based

[9] I am grateful to Elke Teich for discussion of this point.
[10] For examples of the use of participants/informants' judgements, see Berry (1995, 1996).
[11] 16 May 2010. 'Sysfling' is the email channel for SFL exchange of views.

study, it is usually necessary to decide in advance what the hypotheses are going to be, what choices are going to be relevant. In a small study one can afford simply to look at one's texts and see what the differences are. That way one may discover new choices, new hypotheses, not hitherto discussed in SFL, or at least to gain new perspectives on old choices, old hypotheses.

Some linguists seem to be temperamentally suited to small manual analyses, some to large computer-based studies. I will freely confess that I prefer small manual analyses. But I always hope that my more computer-minded colleagues will pick up my hypotheses and test them more fully.

17.3.5 What part should system networks play in our studies?

System networks provide a way of modelling choices. I assume that each system in a network represents a choice, a choice between options, the options being represented by the terms in the system.[12]

System networks give us a way of recording our current hypotheses about the choices included in a language's meaning potential and about the relationships of dependency or otherwise between these choices. It is also possible to record other hypotheses in the networks. For instance, I am currently trying to draw my networks consistently in such a way that in each system the option that I hypothesise is more likely to be successful in informal spoken English comes above the option that I hypothesise is more likely to be successful in formal written English. I am also trying to ensure that the systems which most frequently distinguish between registers and between success and failure within registers come at the left-hand, least delicate side of the network. Of course, if future research goes against the hypotheses, it is necessary to modify the network.

It should be remembered not only that a system network is hypothetical but also that it is only a model and a model is not necessarily the same as the real thing. It is not suggested that a speaker or writer solemnly works her subconscious way through a network making all the choices in the order shown. She may do, but at present we just do not know.

Whether or not a system network represents a programme that a speaker or writer actually follows when making subconscious choices, it certainly can act as a programme for anyone who wants to unpick a text, either to see what choices have been made by a literary writer or to assess her own text with a view to revising it.

[12] For more on system networks and the notation used in them, see Halliday (this volume), especially Figures 1.2, 1.3, 1.4, 1.5 and 1.10 and the discussion surrounding them.

In my experience, teachers like system networks. If one shows them how to use a network in order to unpick texts with a view to comparing them, they can see the point of SFL.

17.4 Some choices emerging from my long-term study

Having theorised Choice in general terms, I will now consider a few of the choices that are emerging from my long-term study. The choices for discussion have been selected with a view to illustrating some of the theoretical points made above.

As I have indicated, I am attempting to identify choices at two levels, semantic choices and contextual choices; semantic choices because, as I said in the opening paragraph, meaning is something that teachers can relate to and also because I share the general SFL view that meaning is central to language; contextual choices because if students are to choose appropriately from the semantic options, they need to make decisions about the situations in which they find themselves. System networks are a heuristically useful way of modelling both these kinds of choice.

I will first discuss a few contextual systems and then a few semantic systems.

17.4.1 A few contextual choices

I have included in my main study the register of radio news and sports bulletins. It seemed likely to add to an understanding of the differences between spoken English and written English if I included study of a hybrid form in which language is written, but in order to be spoken. There might well be a clash between the needs of the writer and the needs of the listeners, who would be hearing the language, not reading it. Such a clash would draw attention to the differences between the character of normal written English and the character of normal spoken English. In Berry (2013) I discuss a practical problem which does arise from such a clash.

Figure 17.1 hopefully captures the contextual choices involved.[13] Medium is from the perspective of the language producer. Is the situation such that the producer will be communicating through speech, i.e. spoken medium, or through writing, i.e. written medium? Channel is from the perspective of the language receiver. Will the receiver be receiving the language through speech, i.e. phonic channel, or through writing, i.e. graphic channel? For most registers, the situation will be either spoken medium + phonic channel, or written medium + graphic channel. However, for radio news and sports bulletins, written medium

[13] For assistance in drawing system networks by computer, I am grateful to Chris Butler and to Mick O'Donnell's UAM CorpusTool.

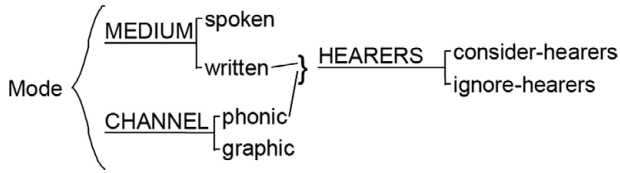

Figure 17.1. A mini-network for Mode

for the producer will be combined with phonic channel for the listeners. The producer then has to decide whether to go ahead and write written English or, bearing in mind the needs of the hearers, to write something that is closer to normal spoken English. Presenters of papers at conferences are faced with a similar choice.[14]

More on the mini-network and discussion of the practical problem mentioned above can be found in Berry (2013). The general theoretical point I am making here is that, in order to choose appropriately from the semantic options, speakers and writers have to make decisions, consciously or subconsciously, about the situation. Sometimes this is just a matter of recognising the features of the situation that are relevant. Adult language users would no doubt normally recognise a situation as being a spoken medium situation or a written medium situation so automatically that the choice would be fully subconscious. However, sometimes more active choosing is necessary. It probably takes more effort for a writer of news or sports bulletins to remember that listeners will be receiving her language through the phonic channel, not the graphic channel. And more effort again to decide to adjust her language in the light of this.

17.4.2 A few semantic choices

In all the registers I have looked at so far, whether they are associated with spoken medium + phonic channel or written medium + graphic channel or written medium + phonic channel, a set of choices which seems particularly relevant to distinguishing the registers and to distinguishing between more successful and less successful instances within the registers is the set of choices between referential meaning options.

Figure 17.2 is an amalgam of the options discussed in Berry (2013) and some of the more important options from Berry (1995).[15]

[14] The terms *medium* and *channel* are taken from Hasan (e.g. 1999:244). However, I have adapted them for my own use, treating them as features of the situation that are 'already there'.

[15] It should be noted that, as a result of the then incompatibility of computers, the system network notation in the published version of the (1995) paper has come out WRONG. Simultaneity brackets have been confused with the brackets of the systems themselves. The first long bracket on the

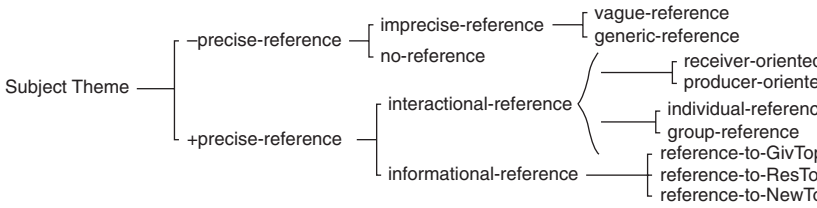

Figure 17.2. A network showing referential meaning options for subject themes

The options were identified initially by comparing passages judged by teachers to be less successful in relation to a schools' writing competition with passages judged to be more successful. They have since been applied to a number of registers of adult spoken language and adult written language. (I emphasised in Section 17.2.5 the importance of **comparative** text analysis in identifying the meaning potential of a language.)

In Figure 17.2 I have shown the Point of Origin of the network as Subject Theme.[16] Effectively the Subject Theme can be regarded as the traditional Grammatical/Syntactic Subject.[17] I said in Section 17.2.6 that for the kind of application I had in mind it was important to be able to locate the realisations of meanings in surface syntactic structure, so that one would know **where** the meaning choices were available. This is the importance of the Syntactic Subject, aka Subject Theme, for my present discussion. It provides the location for the meaning choices I am discussing. I am assuming that the Subject itself represents a place in the surface syntactic structure, but I am interested in the Subject because of the **meaning** choices it makes available. Berry (2013) is wholly devoted to meaning choices available in the Subject slot. Berry (1995) discusses these choices, but also other choices with different Points of Origin.

Two differences in particular among the referential meaning options have proved useful distinguishing features for registers.

1. Do the registers include interactional references or not – i.e. do they include references to the interactants in the discourse, the speakers/writers/hearers/readers? In some registers such references are frowned upon, in other registers they seem to be almost obligatory. For those registers

left-hand side should be a simultaneity bracket, as should the bracket linking personal/collective and writer-oriented/reader-oriented. (For simultaneity, see Halliday, this volume, esp. Figure 1.10).

[16] For Point of Origin, see Halliday (this volume, Section 1.2).

[17] In the (1995) paper I referred to this as Basic Theme. Fawcett (e.g. 2008:182) refers to it as Subject Theme. Since I am here, temporarily at least, allying myself with Cardiff Grammar, I am using Fawcett's term.

which do include interactional references, some typically include receiver-oriented references, i.e. references to hearers or readers, some typically include producer-oriented references, i.e. references to speakers or writers, some typically include both. Some typically refer to individual interactants, e.g. *I*, some typically refer to groups, e.g. *we*. There are also more delicate distinctions, though I have not included them in the network here.

2. How contentful are the references? Some registers admit vague references. Others do not. To what extent are the references to people or things already mentioned in the discourse, to what extent are the references to new people or things? In the network here and in Berry (2013) I have used Dik's (1997) terms: Given Topic (GivTop); Resumed Topic (ResTop); New Topic (NewTop). From the evidence of the registers I have looked at so far, spoken registers rarely introduce NewTops in the Subject slot. Written registers frequently do.

There is no room in this chapter for detailed discussion of these points. Point (2) is discussed in Berry (2013). There is discussion in Berry (1995) relevant to point (1).

17.5 Concluding remarks

To sum up:

Teachers see themselves as extending the range of choices open to their students. SFL with its attention to the paradigmatic axis, also called the axis of choice, can provide information on the choices available. System networks offer a way of modelling choices and visually displaying them. While people usually make the choices subconsciously, teachers need to raise their students' choice awareness.

Meaning is central to language, so the most important choices are semantic choices. However, linguistic form plays a part in two ways. Meanings have to be realised by forms. And syntactic structure can provide a kind of map, showing where the meaning options become available.

It is also necessary to recognise contextual choices. If speakers and writers are to choose appropriately from the semantic systems, they need to assess and make decisions about the situations in which they find themselves.

18 Genre-driven constraints on semantic choice

Víctor M. Castel

18.1 Introduction

In the first part of the Introduction to this book, the editors refer to the two notions of choice defined in Matthiessen *et al*. (2010), namely: choice as option, and choice as selection.* In the Cardiff Grammar framework (CGF), semantic choices, i.e. options, are associated with their probability of occurrence, and thus the *selection* of semantic *options* is probabilistically driven. This chapter addresses the problem of defining a formal mechanism for capturing genre constraints on the semantic options available in English in general. The chapter specifically shows how the CGF notion of *preference* can be extended to express such constraints as a resetting of the probabilities of English in general on the basis of genre-specific properties. An interesting consequence of this approach is that the selection of semantic options in domain-specific contexts is now carried out over a significantly reduced set of 'choices'.

It is well known that domain knowledge imposes significant constraints on the class of possible linguistic signs, i.e. meaning−form pairs, available for use in texts communicating the specificity of the domain (Harris *et al*., 1989; Kittredge & Lehrberger, 1982; Grishman & Kittredge, 1986; Sager *et al*., 1987; Matthiessen, 1999; Halliday & Matthiessen, 1999). This core concept is impeccably modelled and illustrated in systemic functional terms in Halliday and Matthiessen (1999) in relation to the constraining effects that the culinary and weather forecasting domains have on the language of recipes and weather reports.

* The research reported on in this chapter was funded by CONICET, and SeCyT (UNCuyo), Mendoza, Argentina. Aspects of an earlier version of its content were presented as Castel (2009a) at the 21st European SFLC, July, 2009, Cardiff, Wales, and Castel & Villar (2009) at the V ALSFAL, November 2009, Mar del Plata, Argentina. The computational testing of the main generalisations was carried out within the project 06/G485: *GeneSys_IDE: Entorno integral de desarrollo de gramáticas orientadas a la generación de textos. Software para la especificación de gramáticas sistémico-funcionales en el marco del modelo de Cardiff. Las lenguas española e inglesa como casos testigos* (Castel 2009b). I would like to thank Gordon Tucker for valuable comments on the quality group in the sign for *York is a fantastic city* in Figures 18.22 and 18.23.

Hlavacka (2004) is a systemic functional study of the transitivity patterns underlying the genre category Research Announcement of research article abstracts. It illustrates in delicate terms the impact that this particular genre category has on the choice of the process types that realise it. For an integration of aspects of Hlavacka's (2004) generalisations with microplanning algorithms, see Castel (2010b).[1]

A review of the recent literature on genre-driven Natural Language Generation (NLG) reveals that this field also pays close attention to the constraining effects of genre type on text properties. Thus, for example, Henschel *et al*. (2002) present a genre-sensitive algorithm capable of transforming a rhetorical structure into a layout structure. Bateman and Henschel (2007) discuss the constraints imposed by multimodal genres on an integrated generation of text, diagram and layout. Nanard *et al*. (2007) define and implement a mechanism for transforming draft documents created by authors into final multimedia documents that meet genre-specific constraints; since this process is interactively iterated, it facilitates corrective action.

This chapter shares with these NLG approaches the need to integrate into an application the constraining effects that different genre types have on text generation. It specifically shares with Nanard *et al*. (2007) the need to design text generation applications that rely on a strong interaction with the user (cf. Section 18.3 below). But it crucially differs from all of them in that we focus on the impact that specific terminal genre categories have on semantic choice and thus on lexicogrammatical output proper along the lines of Castel (2010b).

The purpose of this chapter is to define a formal mechanism for capturing the constraining effects that genre categories have on the specification of contextually motivated sentences. The properties and consequences of the resulting formalisation will be illustrated with online tourist guides (OTG). The descriptive source on OTG is Villar (2013, forthcoming).

Since we are assuming the SFL modelling of CGF (Fawcett 1980, 2000, 2008, forthcoming a, forthcoming b) in its NLG-oriented facet, we will refer constantly to the current CG generator GeneSys (Fawcett & Castel, 2006) to illustrate the results and make them apparent. However, the formal descriptions involved in the exemplifications could be used by a computational linguist to implement them in any programming language to feed any imaginable generator. Thus, no issues concerning efficiency, precision or exhaustiveness (let alone comparison of them with other generation systems) are addressed here, for the chapter purports to define the mechanism responsible for capturing genre-driven constraints on semantic choice.

In Section 18.2, the distinctive features of CGF are introduced within the context of the CG generator GeneSys. Section 18.3 presents data from OTG

[1] For the concept of microplanning, see Fawcett (forthcoming b, this volume).

to be accounted for within GeneSys, and an example is given of sentence generation within this text type which focuses on how an extension of an existing CGF formal mechanism can be used to narrow down the scope of semantic choices. Finally, Section 18.4 is devoted to presenting the conclusions and suggestions for future work.

18.2 The Cardiff Grammar framework

This section presents the distinctive traits of CGF as instantiated in the current micro- and mini-grammars of English (Fawcett, 2003, 2004b) in their implementation in GeneSys by Fawcett and Castel (2006). The objective is to show how GeneSys can be refined so that it can incorporate the contextual features of the Generic Structure Potential (GSP) of OTG and capture their constraining effects on semantic choice, and thus on lexicogrammatical realisation.

18.2.1 The Cardiff Grammar in its generation-oriented facet

In 1987, the COMMUNAL project began developing a large-scale computational implementation of a Systemic Functional Grammar, with the goal of producing a fully interactive system for NLG and natural language understanding (Fawcett & Tucker, 1990; Fawcett *et al*., 1993). The lexicogrammatical modelling embedded in such an implementation is that of CGF. A generation-oriented definition of CG has recently been re-implemented within GeneSys (Fawcett, 2003, 2004b, Fawcett & Castel, 2006) as a computational environment for generation, and grammar writing and testing.

18.2.2 The lexicogrammar proper

Let Figure 18.1 be a schematic abbreviation of the generation-oriented facet of the Model of a Communicating Mind of Fawcett (forthcoming b, this volume: Figure 6.2), which is adapted to the specific purposes of this chapter. In CGF: (i) the system networks are explicitly developed to model the level of semantics; (ii) the realisations of meanings in lexis, intonation and punctuation have all been integrated with realisations of meanings in syntax and morphology; and (ii) the concept of probability is incorporated, i.e. each of the semantic features is associated with its probability of occurrence.

The main subcomponent of the lexicogrammar is a very large semantic system network that provides choices in the eight strands of meaning recognised in CGF: experiential, logical relationships, interpersonal, negativity, validity, affective, thematic and informational; plus three minor types (Fawcett, 2000, 2003, 2004b, 2008, forthcoming a). The heart of the generator is, then, the

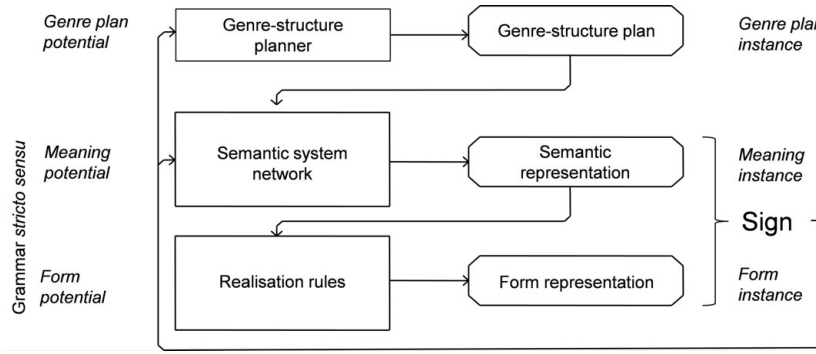

Figure 18.1. The (lexico-)grammar proper in its generation-oriented facet (adapted from Fawcett, 2000, 2008, forthcoming b)

system networks in the lexicogrammar that model the language's meaning potential, i.e. all the meanings that the grammar can make.

The first output from the lexicogrammar is a semantic representation, which has a 'selection expression' of features for each unit, and this constitutes the input to the realisation component, containing the realisation rules to be applied in order to convert the features chosen into a form representation.

The two levels of form and meaning are connected to each other through the fact that the output from the level of meaning is the input to the level of form, more precisely, to the form potential (i.e. the set of realisation rules).

18.2.2.1 Formal properties of the semantic system network

The core formal properties of CGF presented in this section play a crucial role in the discussion on the constraints imposed by genre properties on the choice of semantic features in Section 18.3.2.1. Let now Figure 18.2 exemplify a typical CGF system network as it is illustrated in Fawcett's (2003) micro-grammar of English.

The CG system network in Figure 18.2 is basically a graphical, abbreviated representation of two types of rule: *feature selection rules* and *same pass preference (probability resetting) rules*. The lower-case expressions are semantic features. The curly and square brackets represent conjunctions of systems and disjunctions of *n*-tuples, respectively. The expressions on top of the arrows are system names. The arrows represent implications of the form 'If *p*, then *q*', where *p* is a plain semantic feature, a pair, a triple or a quadruple, and *q* a disjunction of pairs, triples or quadruples. They are pairs of a feature and its probability of occurrence in English in general (EG). They are triples of a feature, its probability in EG, and a same pass preference rule number ('sp1', 'sp2', etc.) or a *realisation rule* (RR) number (rr1, rr2, etc.). They are

quadruples of a feature, its probability in EG, a same pass preference rule number, and an RR number.

A feature selection rule is an implication of the form 'p → *select from* q', where *p* is a (conjunction of) feature(s), e.g. 'entity', and *q* is a disjunction of two or more features, e.g. 'situation', 'thing' and 'minor relationship with thing'. This implication is to be understood as an instruction to select one of the disjunctive features 'situation', 'thing' or 'minor relationship with thing' whenever the input condition of the rule is met (in the example, 'entity'). The selection of the feature is contingent upon the probability of occurrence assigned to it. Thus, in Figure 18.2, only 'situation' can be 'selected'.

A same pass preference rule is an implication of the form 'p → *for same pass prefer* q', where *p* is a (conjunction of) semantic feature(s), and *q* is a resetting of the probabilities of one or more systems in the CG system network. Same pass preference rule numbers in *n*-tuples trigger the application of such rules as soon as the feature calling it is selected. Let the rules in Figure 18.3 be the same pass preference rules referred to by specific features of the network in Figure 18.2. The dots on top of arrows range over system names. The dots on the right-hand side of arrows range over disjunctions of features or conjunctions of systems.

RR numbers in *n*-tuples of the network are references to the RRs that must be applied **after** a pass through the network delivers a selection expression. The function of such RRs is to construct a linguistic form on the basis of configuration of features of the selection expression. An RR is an implication of the form 'p → q', where *p* is a (disjunction or conjunction of) feature(s), and *q* is a(n) (conjunction of) operation(s) belonging in one of the following six types (Fawcett, 2000): *filling*, *composition*, *exponence*, *conflation, system network re-entrance* and *lower unit preference resetting*.

A lower unit preference is an operation of the form 'for *r* prefer *s*' that occurs as part of the consequent *q* of an RR implication 'p → q', where *r* is an element/participant role, e.g. the element 'S(ubject)') / the role Agent, and *s* is a (conjunction of) pair(s) of a feature and its probability of occurrence that serves the purpose of resetting the probabilities of the relevant system(s) in re-entering the network to construct a specific selection expression for the participant role in question. Let the rules in Figure 18.4 be the RRs referred to by specific features of the network in Figure 18.2 (lower unit preference operations are in bold).

The function of same pass preference rules is to constrain the pass through the network, namely, the application of feature selection rules, by resetting the initial state probabilities, i.e. the network probabilistic state before the traversal (= pass through the network) is carried out. Each same pass preference rule is a constraint imposed by a specific (configuration of) feature(s) on the probabilistic distribution of other (configuration(s) of) feature(s) in the network.

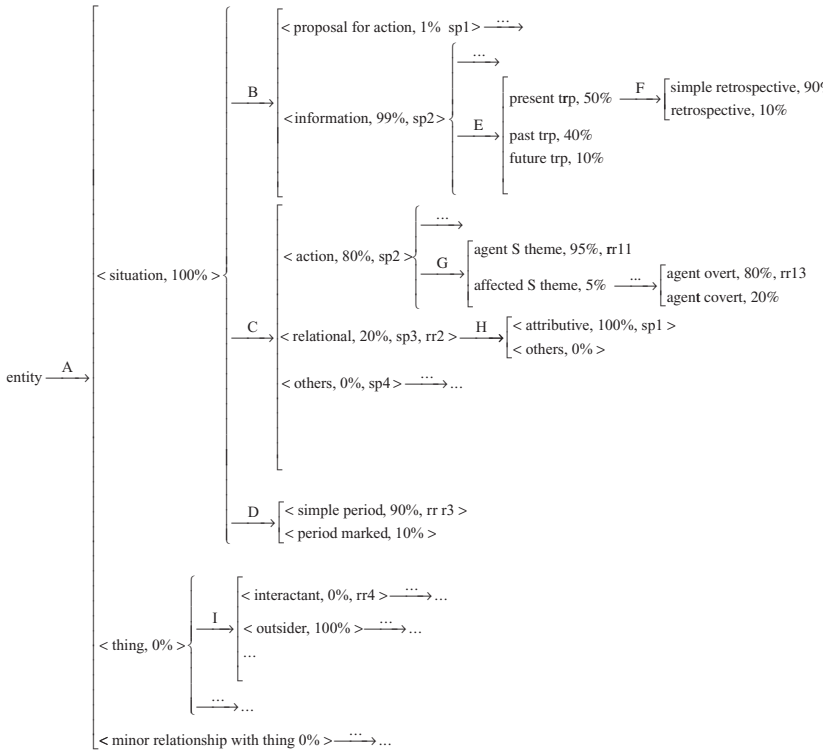

Figure 18.2. Example of a typical CG system network (adapted from the micro-grammar of English of Fawcett, 2003)

KEY:
A = ENTITY TYPE; B = MOOD; C = TRANSITIVITY; D = PERIOD MARKING; I = INTERACTION ROLE; E = TIME REFERENCE POSITION; G = SUBJECT THEME; H = RELATIONAL TYPE; F = RETROSPECTIVITY.

sp1 :

proposal for action or attributive → for same pass prefer

$_{D}$<99.9% simple period, 0.1% period marked>.

sp2 :

present trp and simple retrospective → for same pass prefer

$_{D}$<1% simple period, 99% period marked>

proposal for action → for same pass prefer

$_{G}$<99.9% agent S theme, 0.1% affected S theme>.

Figure 18.3. CG micro-grammar examples of same pass preference rules

rr11 : agent S theme : Ag by S, for Ag re-enter at <entity>,
for Ag prefer <100%, thing>, …

rr13 : agent overt : for C re-enter at <entity>,
for C prefer <100%, minor relationship with thing, 100%, passive-marker>.

Figure 18.4. CG micro-grammar examples of lower unit operations in RRs

Probabilities in *n*-tuples define the probabilities of occurrence in EG that the disjunctive features have of being selected in a given pass through the network. These explicit probabilities are sensitive to the probabilities implicitly defined by the preference rules in *n*-tuples, i.e. the initial state probabilities of the network can be modified by same pass preference rules.

For example, if the feature 'proposal for action' is selected, then the same pass preference rule 'sp1' alters the initial state probabilities of D's features so that the features 'simple period' and 'period marked' are reset to a probability of 99.9% and 0.1%, respectively.

A more complex example is illustrated by the same pass preference rule 'sp2', which is triggered by selecting the feature 'action'. This rule stipulates that if both the features 'present trp' and 'simple retrospective' are selected in a given pass through the network, then the probabilities of occurrence of the features 'simple period' and 'period marked' must be reset to 1% and 99%, respectively. The rule also stipulates that if the feature 'proposal for action' is chosen, then the initial state probabilities associated with the features 'agent S theme' and 'affected S theme' are to be reset to 99.9% and 0.1%, respectively.

Traversing the network amounts to choosing features from systems in a top-down and depth-first fashion until the pass is completed, i.e. a semantic feature structure is constructed. Consider the selection expressions in Figures 18.5–18.10.

If there were no same pass preference rules, the feature structures in Figures 18.5–18.10 would all be network instances *with identical probabilities of occurrence* in EG. But there are indeed same pass preference rules associated with some of the features in the network, namely 'sp1' and 'sp2' of Figure 18.3. Thus, the feature structures in Figures 18.5, 18.8 and 18.9 are 'vastly more frequent' in EG than the feature structures in Figures 18.6, 18.7 and 18.10.

The function of the lower unit preference operation 'for Ag prefer <100%, thing>' of rr11 (Figure 18.4), along with the operation 'for Ag re-enter at <entity>', is to enforce the selection of the feature 'thing' in constructing the selection expression that will turn out defining the semantics of the participant role 'Ag' that has been conflated with the element 'S'. Similarly, the lower unit preference operation 'for C prefer <100%, minor relationship with thing, 100%, passive-marker>' in rr13 enforces a specific semantics for the element C(omplement).

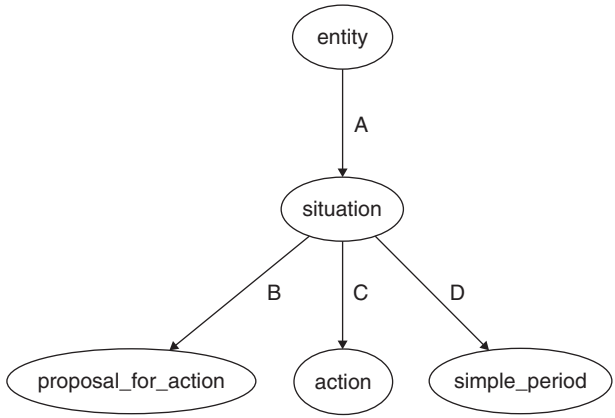

Figure 18.5. Configuration of frequent occurrence in EG (see 'sp1' in Figure 18.3): example of realisation – *Kiss Ike*

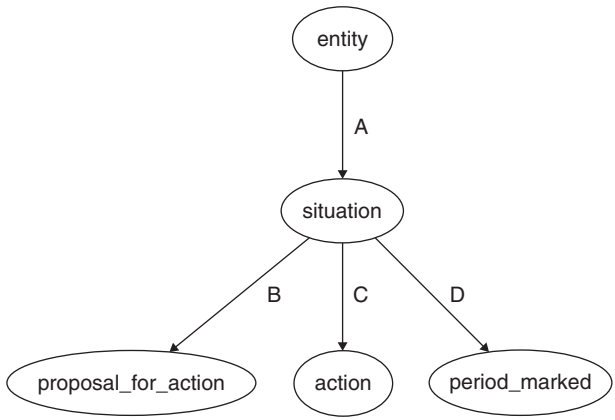

Figure 18.6. Configuration of infrequent occurrence in EG (see 'sp1' in Figure 18.3): example of realisation – *Be kissing Ike*

Both same pass preference rules and lower unit preference operations are constraints on the probabilistic distribution of features in the network. The former constrain feature probabilities in the same pass through the network, i.e. they reset feature probabilities of a given pass. The latter constrain feature probabilities in lower or dependent passes through the network, i.e. passes triggered by elements or participant roles of higher units, e.g. the role Ag(ent) conflated with the element 'S' of the unit 'Cl', that preselect specific

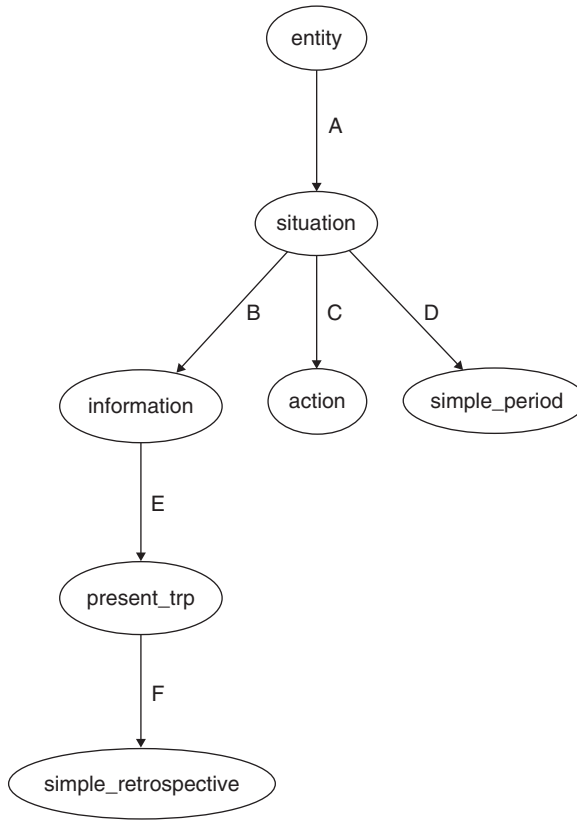

Figure 18.7. Configuration of infrequent occurrence in EG (see 'sp2' in Figure 18.3): example of realisation – *Ivy kisses Ike*

feature configurations for their selection expressions.[2] In other words, same pass preference rules define co-occurrence restrictions among features of a given selection expression, whereas lower unit preference operations preselect feature configurations of selection expressions that must eventually fill higher unit participant roles. Lower unit preference operations are a powerful, yet a very simple, constraining mechanism that resembles Chomsky's (1965) 'selection restrictions'. In Halliday and Matthiessen (1999), the equivalent of the CGF lower unit preference operations is graphically represented as in Figure 18.A1 of the Appendix with an arrow connecting, e.g., the feature 'doing by cook' in

[2] See, for example, the path 'Cl | S/Ag | sign | entity | thing' in Figure 18.12. This feature structure is enforced by the lower unit preference contained in rr11.

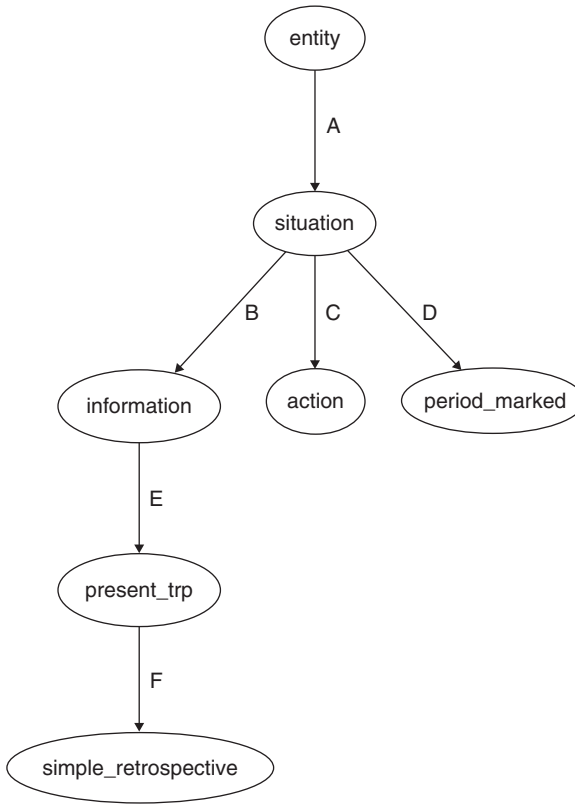

Figure 18.8. Configuration of frequent occurrence in EG (see 'sp2' in Figure 18.3): example of realisation – *Ivy is kissing Ike*

the *figure* sub-network (roughly, *situation* in the CG network), associated with the role Agent, with the feature 'cook' in the *element* sub-network (roughly, *thing* in the CG network). Note that 'cook' is part of a feature path including 'person'.

The network in Figure 18.2 is then a graphical, abbreviated definition of the semantic potential of EG and the corresponding RRs that such a potential specifies as associated with it. By semantic potential we understand the class of selection expressions, i.e. the semantic feature structures, that can be enumerated by traversing the system network in accordance with the explicit probabilities and the resetting of these probabilities by same pass preference rules and lower unit preference operations. There will be as many traversals of the network as allowed by its same pass preference rules and lower unit

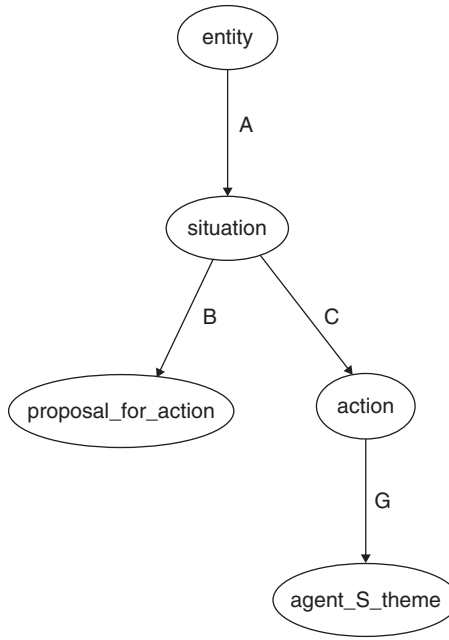

Figure 18.9. Configuration of frequent occurrence in EG (see 'sp2' in Figure 18.3): example of realisation – *Don't touch it!*

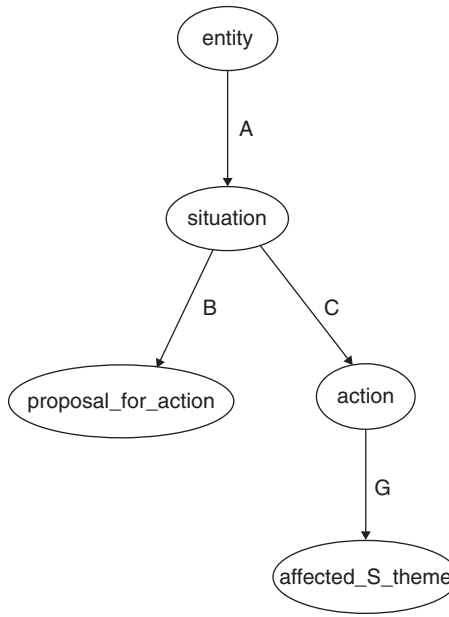

Figure 18.10. Configuration of infrequent occurrence in EG (see 'sp2' in Figure 18.3): example of realisation – *Don't be touched by it!*

preference constrained combinatory possibilities. Each pass can be carried out randomly, based entirely on the explicit and implicit probabilities, or interactively, based on such probabilities and also on decisions made by the user in a dialogic fashion with the generator.[3]

18.2.2.2 Substantive properties of the semantic system network

Consider the early options in the TRANSITIVITY network in Figure 18.11 given by Fawcett (forthcoming a) for a CG lexicogrammar of EG. The dotted lines in the figures abbreviate more delicate systems that are not specified here due to space limitations.

The role of probabilities in Figure 18.11 is conceptualised in the following terms (Fawcett, forthcoming a:32–33):

> The figures for the probabilities on the systems are derived from whatever sources we can find. The problem is that most frequencies available from corpus studies are for forms rather than meanings, and for items rather than abstract constructions – and here we are trying to estimate probabilities of a very high level of generality that are essentially distinctions in meanings rather than forms. . . . Many of the less delicate choices [in this network] are derived directly from the figures used in the GeneSys generator, which were the result of careful guesswork by the team working on it at the time. Our view is that it is better to make an informed estimate than to omit probabilities altogether. For example, we are clear that 'attributive' Processes are more frequent than 'matching' Processes, and this 'fact', as we take it to be, is therefore reflected in the figures given.

The system network of EG in Figure 18.11 is used in Section 18.3 to show how the formal mechanism presented in Section 18.2.2.1 can be extended to express the preferences on semantic choice imposed by OTGs, i.e. how the probabilities in Figure 18.11 are reset by properties of OTGs. The probabilities in the system networks for OTGs discussed in Section 18.3 are extracted from Villar (2013, forthcoming), which include aspects of a corpus-based description of the transitivity profile of OTGs.

18.2.2.2.1 The CGF micro- and mini-grammars of English

There are currently two working grammars of EG that can be run with GeneSys to generate sentences in isolation, whether interactively or randomly: the micro-grammar (Fawcett, 2003) and the mini-grammar (Fawcett, 2004b). They differ in descriptive latitude and therefore also in the refinement of the meaning–form representations assigned to the sentences within the observational scope of the respective grammars. They have so far served the purpose of grammar development, testing and illustrating both key characteristics of the CGF modelling

[3] For a discussion on the kind of dialogue involved in planning the generation of research article abstracts, see Castel (2010b).

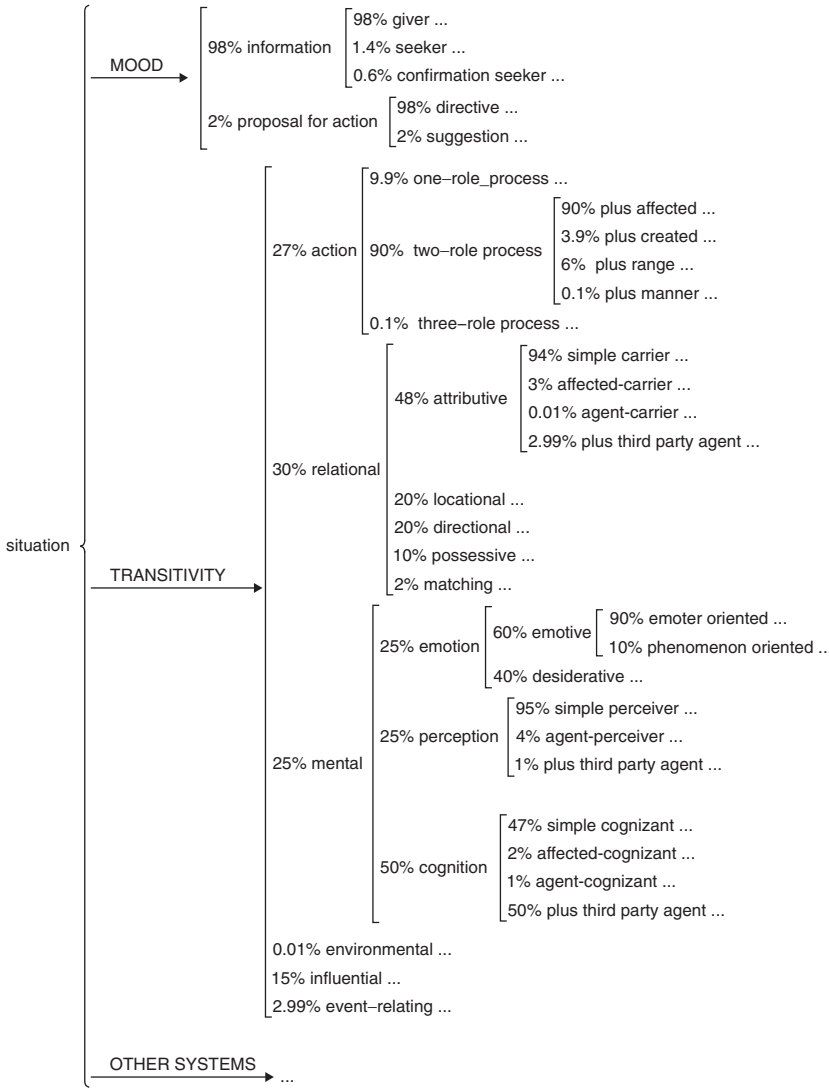

Figure 18.11. The early options in the TRANSITIVITY network of EG (extracted from Fawcett, forthcoming a)

of EG, and the functionalities of GeneSys as the generator of the COMMUNAL project. In Section 18.2.2.1, we used aspects of Fawcett's (2003) micro-grammar of English to illustrate the intervention of same pass and lower unit preferences in defining the semantic potential of EG. We now use it to illustrate an output from GeneSys as exemplified by Figure 18.12. The mini-grammar of English is used below (cf. Figure 18.23) with a few adjustments to generate sentences in their natural contexts.

The apparent complexity of this representation of a very simple sentence, *Ike has kissed Victoria*, and the even more complex representation given in Figure 18.23 for *York is a fantastic city*, is just a reflection of the complexity of the underlying grammar, which in turn reflects the inherent complexity of natural languages when these are formally modelled. In fact, output representations like Figures 18.12 and 18.23 are the result of a new functionality provided by GeneSys, namely, graphs that allow for a clear visualisation not only of correlations between meaning and form but, crucially in the context of this chapter, also correlations between these meaning−form pairs and the relevant higher-level (terminal) genre categories.

How much to show to the user of a generation system depends on his/her degree of expertise and/or the specific goals of the application into which the generator is embedded. In some cases, it will definitely suffice to output just the string of characters that make up the sentence, e.g. 'Ike has kicked Victoria'. To this purpose, GeneSys contains a representation stripper component whose function is precisely to eliminate the meaning and form structures underlying such a string of characters. See Fawcett (this volume, Figure 6.2). But a (computational) linguist or an advanced student might want to have access to the sign corresponding to a given sentence in its full representational power, for it is a fundamental aspect of the descriptive generalisations of the lexicogrammatical potential.

One important limitation of the current version of GeneSys is that it cannot account for the generation of sentences in their natural contexts. In fact, GeneSys only generates sentences in isolation. Then, the goal of this chapter cannot be attained unless this problem is solved. The following sections are devoted to showing how a solution can be entertained that allows for the generation of sentences in the context of OTGs.

18.3 Genre constraints on semantic choice: the case of OTGs

Villar (2013, forthcoming) is a study of the generic structure and transitivity potentials of OTG. As stated in Section 18.1, we will here formalise aspects of the main descriptive results in the context of CGF and GeneSys. The main generalisations of these studies are presented as the system networks in Sections 18.3.1 and 18.3.2 below.

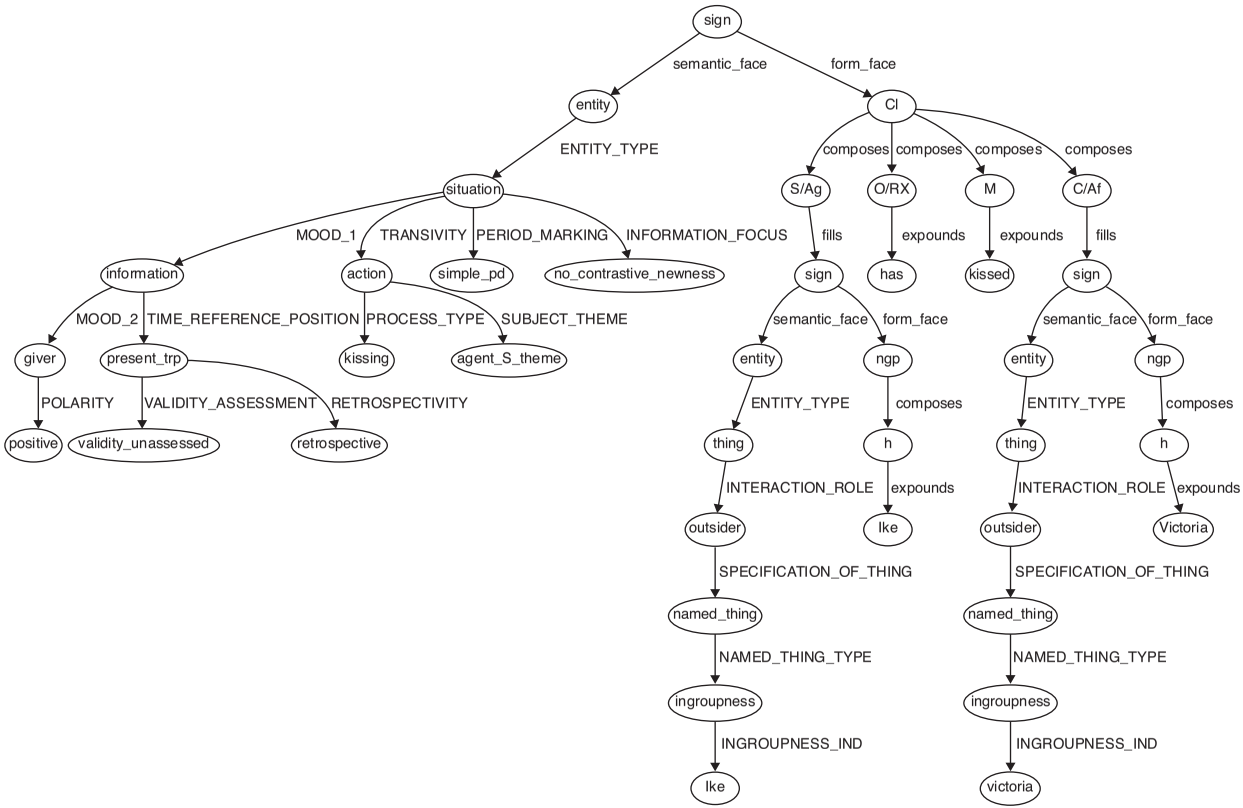

Figure 18.12. Sign for *Ike has kissed Victoria* generated by GeneSys with the micro-grammar of English of Fawcett (2003)

Place presentation ^ [(Place description {=Geographical traits ^ Location proper ^ (Historical background)}) ┘° (Service offer {=Activities ^ (Transport) ^ (Hotels)})] ^ (Additional information)

Figure 18.13. GSP of OTG (extracted from Villar, 2013, forthcoming)

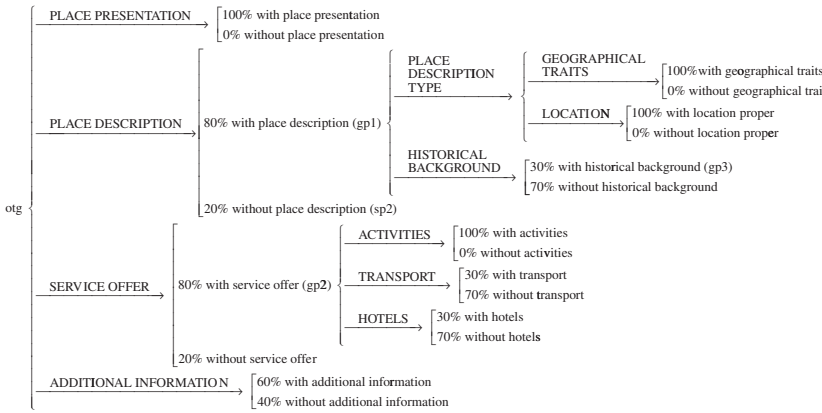

Figure 18.14. GSP of OTG (extracted from Villar, 2013, forthcoming)

18.3.1 The Generic Structure Potential of OTGs

According to Hasan's (1996c) formula for representing the GSP of a given text type, the GSP of OTG can be captured as in Figure 18.13.

'{=}' is used to introduce subconstituents; '^' indicates relative fixity: the element on its right cannot precede the element on its left; '( )' are used to enclose optional constituents; '°' indicates that the order of the constituents is not fixed, i.e. the order of the elements on the two sides of '°' is reversible; '┘' indicates that a (set of) constituent(s) is recurrent; '[ ]' are used to establish the scope of both '°' and '┘'.

The GSP of OTG in Figure 18.13 is implemented as the system network of genre features in Figure 18.14. As a reformulation of GeneSys, the COMMUNAL sentence generator (Fawcett *et al.*, 1993; Fawcett & Castel, 2006), GeneSys_IDE is currently under development. One goal of GeneSys_IDE is to enhance GeneSys to allow for the generation of sentences in their natural contexts.

Excerpts (1) and (2) illustrate the kind of analysis carried out in Villar (2013, forthcoming).[4] Genre categories are superscripted and subscripted. Subscripted genre categories are daughters of superscripted categories. Pairs of

[4] Villar's (2013, forthcoming) description was carried out in the context of the hypotheses and methodology of the RedACTe project (Castel, 2010a). By producing analyses like the annotated excerpts below and the systems in Figures 18.14, 18.16, 18.17 and 18.18, we are honouring

superscripted and subscripted square brackets identify the relevant constituents. Normal square brackets are used to enclose semantic features.

Excerpt (1) York Online Tourist Guide

[with_place_description *Whether you come* [relational | directional | agent carrier] *for a cultural weekday getaway or a romantic weekend break, York is* [relational | attributive | simple carrier | be'] *the place to be. Renowned for its exquisite architecture, tangle of quaint cobbled streets and the iconic York Minster, York is* [relational | attributive | simple carrier | be'] *a fantastic city. A city of contrasts and exciting discoveries. York is* [relational | attributive | simple carrier | be'] *a place where the old encompasses* [relational | possessive | simple carrier] *the new and the commonplace meets* [action | two-role process | plus affected] *with the unexpected*.] [with_service_offer *Broaden* [action | one-role process | affected only] *your mind with a visit to world class museums or a variety of festivals held* [action | two-role process | plus affected] *throughout the year catering* [action | two-role process | plus affected] *for all ages and interests*.]

[with_place_description *Set in beautiful gardens in the heart of York, the Yorkshire Museum is* [relational | attributive | simple carrier | be'] *home to some of the most fascinating archaeology and geology in the region*.] [with_service_offer *See* [mental | perception | simple perceiver] *Roman sculpture, mosaics, jewellery and pottery. Discover some of Europe's greatest Viking and Anglo-Saxon finds including the 8th Century York Helmet. Admire* [mental | emotion | emoter oriented] *the stunning medieval Middleham Jewel, a sapphire set in intricately engraved gold. See* [mental | perception | simple perceiver] *Yorkshire as it was* [relational | attributive | simple carrier | be'] *200 million years ago in the Hunters and Hunted gallery of fossilised creatures*.

Enjoy [mental | emotion | emoter oriented] *our interactive family exhibition Fingerprints of Time – see* [mental | perception | simple perceiver] *if you can crack* [action | two-role process | plus affected] *the dating code!*]

. . .

(Excerpt from Top 15 places to visit [Online]. Available at <http://visitbristol.co.uk/usa/top-15-places-to-visit> [accessed 11 November 2008].)

Excerpt (2) Avebury Online Tourist Guide

[with_place_description [with_geographical_traits *Avebury is considered* [relational | attributive | plus third party agent] *one of the most important megalithic monuments in Europe, and along with Stonehenge, is* [relational | attributive | simple carrier | be'] *one of South West England's 5 World Heritage sites*.] [with_historical_background *It was built* [action | two-role process | plus created] *from 2800 BC onwards with stones from surrounding hills and includes* [relational | possessive | simple carrier] *the largest stone circle in the world*,] [with_location_proper *which encompasses* [relational | locational | agent-carrier] *part of the village of Avebury itself*.]]

[. . .]

(Excerpt from Top 15 places to visit [Online]. Available at <http://visitbristol.co.uk/usa/top-15-places-to-visit> [accessed 11 November 2008].)

Halliday's SFL methodological principles, specifically the one referring to the need to avoid 'running commentary' in descriptive practice. Along these lines, see also Hlavacka (2004).

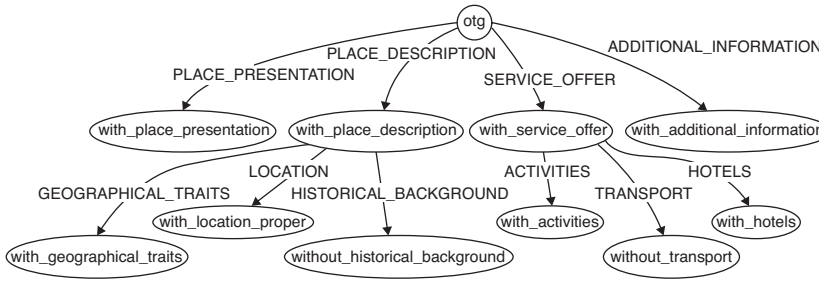

Figure 18.15. OTG genre structure instance generated by GeneSys_IDE

The reason for adopting the system network of genre features in Figure 18.14 instead of the orthodox formula in Figure 18.13 for defining the GSP of OTG is that it can be readily implemented in GeneSys_IDE **using the current formal resources existing in CG**. The GSP of OTG in Figure 18.14 is defined as a system network in accordance with the specification given in Section 18.2.2.1. Basically, it is a set of material implications of the form 'p → q', where 'p' is a genre feature and 'q' is a (conjunction of) genre system(s). A genre system is a disjunction of two or more genre feature values. The genre system name is a functor mapping the argument feature 'p' onto the disjunctive values defined by the genre system.

Obligatoriness of a feature 'f1' is captured by the disjunction '100% with_f1 ∨ 0% without_f1', and optionality of a feature 'f2' is captured by the disjunction 'X% with_f2 ∨ Y% without_f2', where both 'X' and 'Y' are greater than 0. The relative order of genre constituents is captured by interpreting the resulting instances of the top-down conjunction of genre system names in Figure 18.14 as left−right sequences of genre features. This chapter ignores a redefinition of both 'recurrence' and 'reversibility'.

The traversal of the genre network in Figure 18.14 is initiated by the user's choice of the contextual option 'OTG' (as contrasted to, say, 'ReArAb' and 'In isolation') and clicking on the button 'Generate' in GeneSys_IDE's relevant dialogue window. ReArAb is the choice triggering generation of research article abstracts. 'In isolation' is the choice triggering (interactive or random) generation of isolated sentences. These contextual options suggest an open list of different genre varieties, where each genre amounts to loading into the generation system the relevant set of genre-driven constraints (see Section 18.3.2).

Figure 18.15 is the graph of an instance of generic structure constructed by GeneSys_IDE once a traversal of the genre network in Figure 18.14 is completed. The challenge for GeneSys_IDE is to generate for each terminal genre category (preceded by 'with') of the feature structure in Figure 18.15 the (set of) sentence(s) capable of filling it. Terminal categories preceded by

'without' are simply deleted at the end of the generation process. Section 18.3.2 shows how this can be done.

18.3.2 Narrowing the scope of choices

Since realisation rules in a systemic functional grammar are semantically driven, the link between the terminal 'with' features of a genre structure like the one in Figure 18.15 and the sentence(s) associated with them is to be found in the system network of semantic features of the lexicogrammar that is expected to provide such output(s). But we certainly do not want to generate sentences such as, for example, *Ike has kissed Victoria* (cf. Figure 18.12), among the potentially infinite number of English sentences that definitely do not belong in the terminal genre categories of Figure 18.15. How are these inappropriate sentences avoided in a context like this? Or to put it positively, how can we determine the class of sentences that do fit in such places? Part of the answer is in the constraining effects that the domain of OTG imposes on the semantics of EG, i.e. on the system network of semantic features of EG defined in Figure 18.11. The assumption here is that in the generation of OTGs the generic structure can be 'intelligently' associated with a lexicogrammar like CG by narrowing the scope of the semantic features available for choice. In what follows, we assume that GeneSys_IDE has loaded a version of the mini-grammar of EG that differs from Fawcett's (2004b) version in two ways. First, it incorporates the category 'sign' to account for the fact that CG defines meaning−form pairs, where the meaning-face of the sign is a structured selection expression of semantic features, and the form-face of the sign is a structured representation of syntax, items and punctuation. Second, it defines system network rules for a few essential aspects of the Quality Group ('qlgp') proposed in Tucker (1998).

18.3.2.1 Genre-based preferences of semantic features

The lower unit preference formalism presented in Section 18.1 can be extended to account for the constraining effects that genre categories have on the choice of semantic features. The extension consists in allowing 'p' of the implication 'p → q' to range over genre features. We will refer here to this extended rule type as Genre-based Preference Resetting (GPR). Crucially, we will let these rules be associated with specific genre features of structures like the one in Figure 18.15. We thus pave the way to define the class of possible sentences that can realise a given terminal genre category.[5]

[5] GeneSys_IDE also extends the use of the same pass preference rule formalism to define constraints inherent to the GSP of OTG. Thus, for example, a rule like 'sp2', associated with the feature 'without place description' in Figure 18.14, serves the purpose of enforcing the obligatory

The function of GPR rules is to cause a significant, **empirically motivated reduction on the set of semantic choices out of which the microplanning algorithms help the user of GeneSys_IDE (or the generator itself) make the relevant decisions (see footnote 1)**. These decisions are made not on the system network of semantic features of EG (cf. Figure 18.11), but on the system network of EG as narrowed down by the genre categories of OTG (Figures 18.16, 18.17 and 18.18). For the sake of illustration, consider the GPR rule 'gp1' in (3), associated with the genre feature 'with place description' (cf. Figure 18.14).

(3)

gp1 : with_place_description → prefer_in_semantics 100% written & 100% formal & 100% situation & 100% information & 100% giver & 3% action & 97% relational & 100% two_role_process & 100% plus_created & 38% build' & 38% create' & 24% design' & 66% attributive & 98% simple carrier & 100% be & 2% plus third party agent & 90% designate & 10% consider & 3% locational & 1% directional% 26% possessive & 4% matching & 98% be' & 2% designate' & 46% remain' & 31% locate & 23% surround' & 50% reach' & 50% stretch' & 25% have' & 30% include' & 24% offer'% 3% provide' & 9% own' & 9% give' & 46% blend' & 33% mix & 21% combine' & 100% agent_subject_theme & 100% present_trp.

The task of this rule (and analogous GPR rules with the features 'with historical background' and 'with service offer' as entry conditions) is to reset the probabilities of the semantic system network of EG in Figure 18.11 as in Figures 18.16, 18.17 and 18.18, depending on whether linguistic realisation is to be carried out for the genre categories 'with place description', 'with historical background' or 'with service offer' respectively. Due to space limitations, not all features and/or probability resettings specified in Figures 18.16, 18.17 and 18.18 are defined by GPR rules of the type illustrated by 'gp1' in (3). However, the rationale is that any differences between Figures 18.16, 18.17 and 18.18, on the one hand, and Figure 18.11, on the other, must follow from GPR rules. The prime notation on the base form of verbs is here used as an abbreviation of the more delicate systems that should be defined in due course for each subtype of process.

Note that GPR rules are formally very simple and their computational implementation is trivial. The actual complexity lies in the quantity and quality of the systematic correlations between genre properties and semantic properties that they are expected to capture. But until discovery procedures are found and tools are developed to automate this kind of mapping, there is no way of

presence of Service Offer if the category Place Description is absent. Note that this extension involves allowing 'p' to range over genre features. It is not clear how the orthodox formula in Figure 18.13 would capture this empirically motivated constraint on the distribution of genre categories.

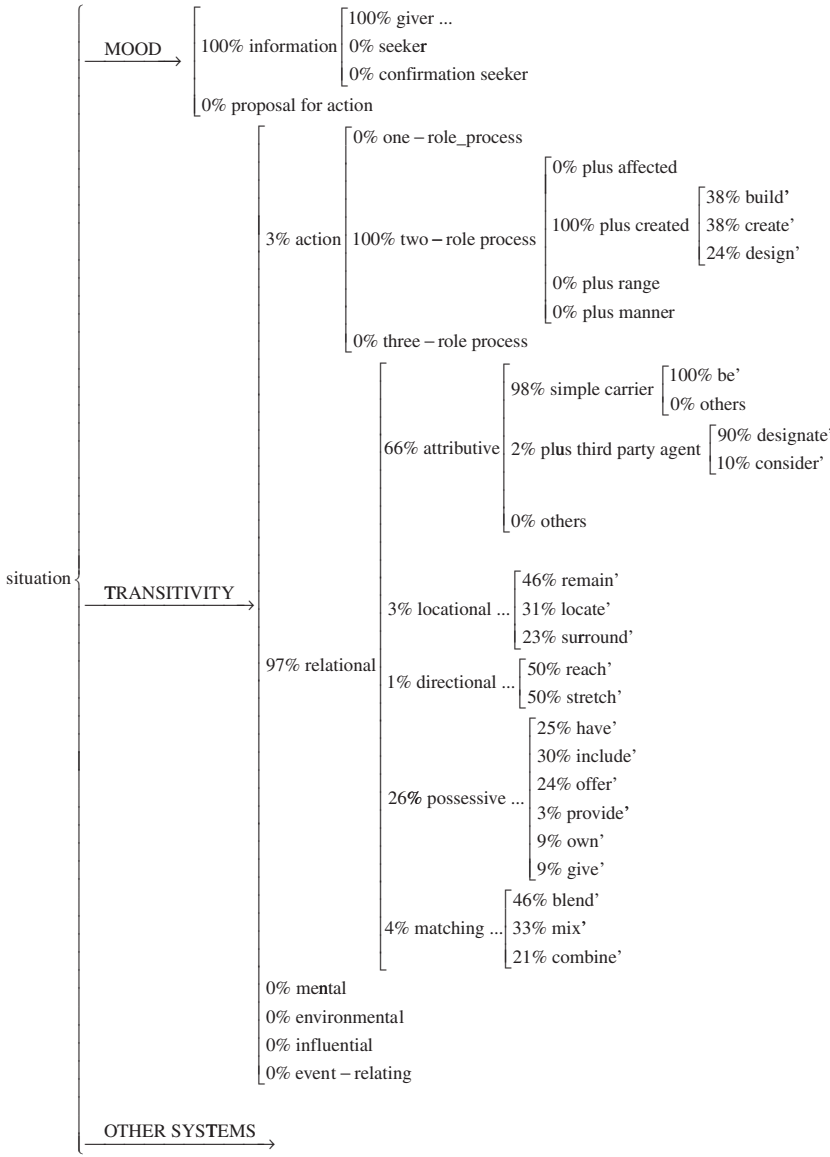

Figure 18.16. Genre-driven probability resetting: choice narrowing based on feature *Place Description* (adapted from Villar, 2013, forthcoming)

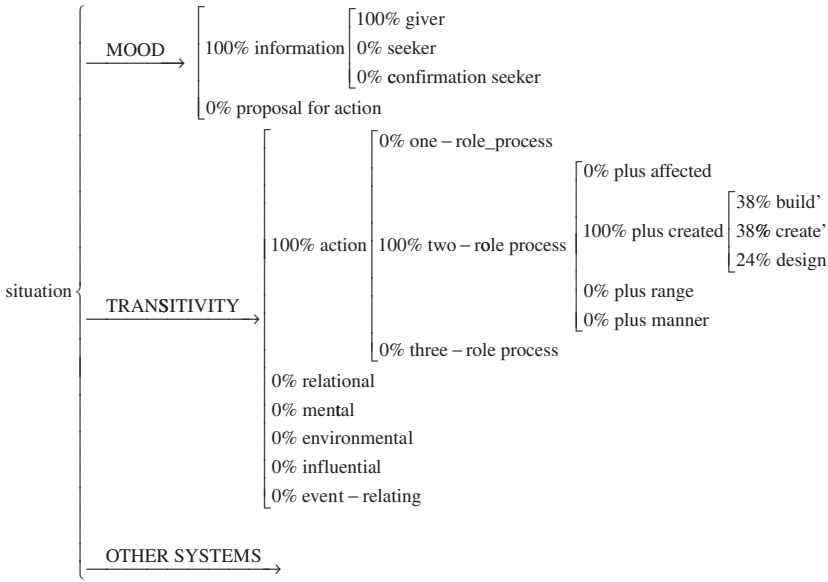

Figure 18.17. Genre-driven probability resetting: choice narrowing based on feature *Historical Background* (adapted from Villar, 2013, forthcoming)

bypassing the inductive manual annotation of texts that is required to obtain the relevant generalisations (cf. excerpts (1) and (2) above). Note also that this is not a 'burden' on the generation system but on the linguist responsible for discovering underlying regularities. Once GPR rules are implemented into the generator by a computational linguist, no realistic issues are posed to the NLG application.

Let us now assume that we want to generate a sentence for the terminal genre feature 'with geographical traits' of the generic structure in Figure 18.15, and that this structure has already been defined. At this stage of the generation process, the GPR rule in (3) has already reset the probabilities of Figure 18.11 into the probabilities of Figure 18.16 on the basis of the mother of 'with geographical traits', namely 'with place description'. It is from this drastically reduced potential of semantic features that the user, in the case of interactive generation, or the generator itself, in the case of random generation, must decide which feature(s) to choose. Note that there is a path, 'situation | information | giver', which is completely predetermined from genre structure by GPR 'gp1' in (3) on the basis of the category 'with place description'. But there is a configuration of possible semantic paths in Figure 18.16 that still need to be traversed to make appropriate selections.

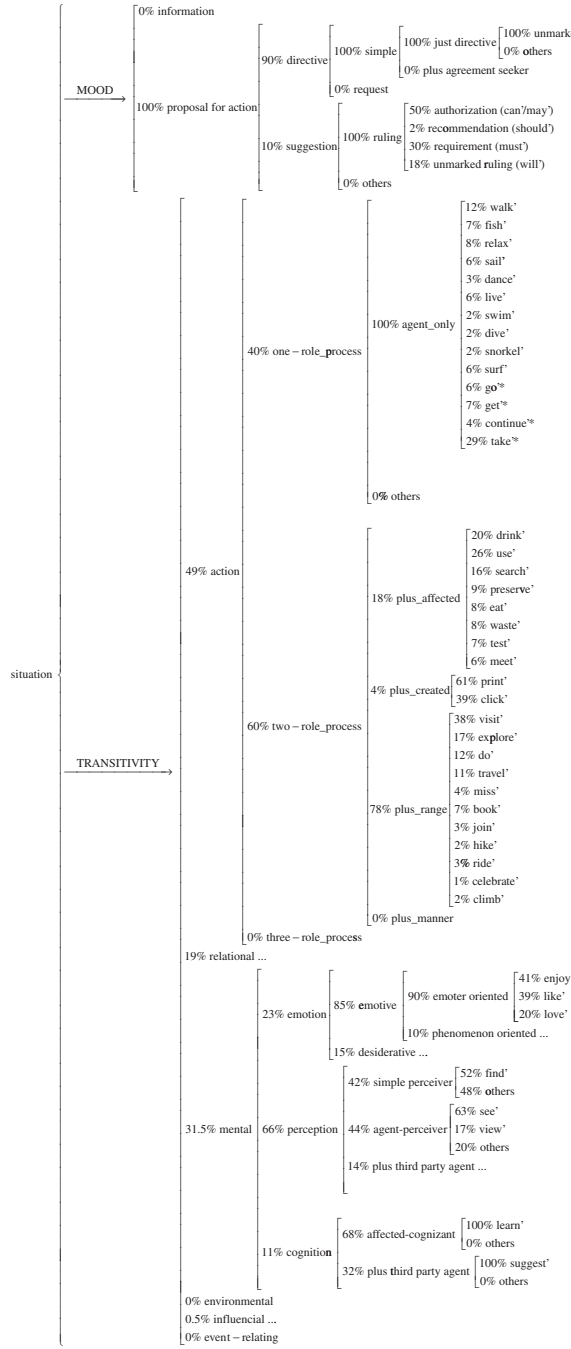

Figure 18.18. Genre-driven probability resetting: choice narrowing based on feature *Service Offer* (adapted from Villar, 2013, forthcoming)

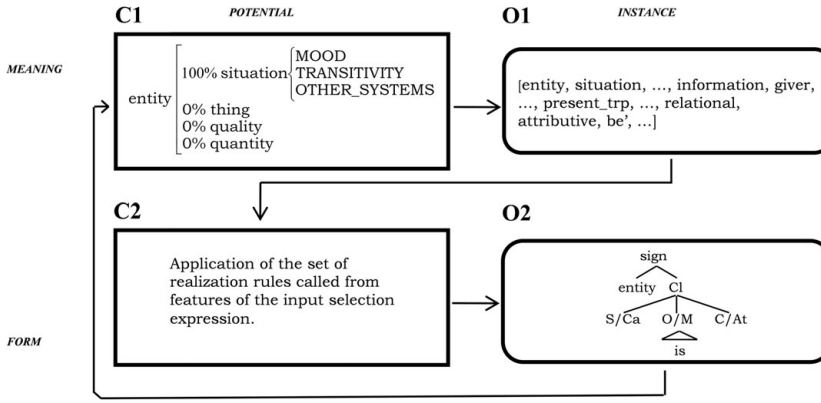

Figure 18.19. Sign constructed from selection expression resulting from first traversal through the system network called by genre category 'with geographical traits'

This configuration of possible semantic choices can be further narrowed down on the basis of the more specific contextual properties belonging to the terminal genre category 'with geographical traits'. For the details of this more delicate genre-motivated constraining effect on available semantic choices, see Villar (2013, forthcoming). It is from this further reduced set of semantic choices that the user must make his/her own selections under the guidance of the microplanning algorithms. Microplanners are algorithms that manipulate the relevant sets of criteria for the selection of contrastive choices (see footnote 1). Some of these microplanners are higher-level algorithms in the sense of Fawcett (forthcoming b, this volume), and some of them are same-level algorithms in the sense of Castel (2010b). Of these two types of microplanner, it is the latter that is involved in this chapter.

Figures 18.19–18.22 illustrate schematically the process by which GeneSys_IDE generates the sentence *York is a fantastic city*, which is a possible realisation within the context of the genre category 'with geographical traits'. Note that these figures reproduce the CG grammar proper components in Figure 18.1, and deploy aspects of the input and output information suggested by the arrows. The boxes C1−C8 are schematic abbreviations of rules, where C1, C3, C5 and C7 are system network rules, and C2, C4, C6 and C8 are realisation rules. The output boxes O1−8 are schematic abbreviations of structures, where O1, O3, O5 and O7 are selection expressions, and O2, O4, O6 and O8 are signs, i.e. pairs of selection expressions of semantic features and form structures. Since space limitations limit us from drawing complete output representations, the reader is asked to imagine that instead of just plain 'entity'

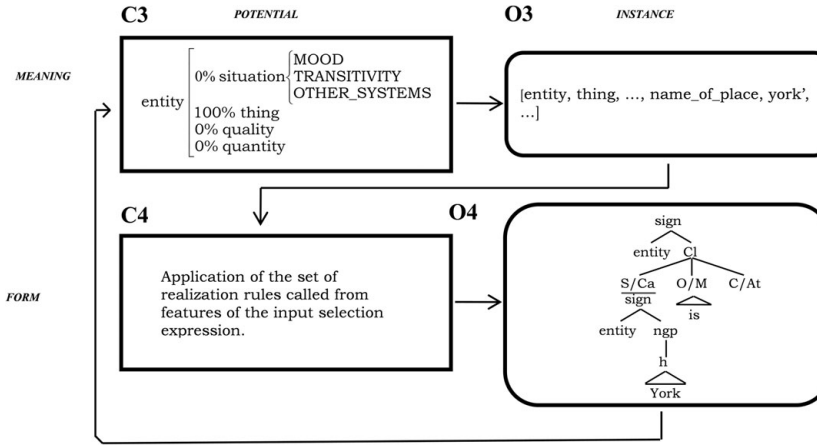

Figure 18.20. Sign constructed from selection expression resulting from second traversal through the system network called by Subject-Carrier

in O2, O4, O6 and O8, there is a structured selection expression of semantic features along the lines of the subgraphs headed by 'entity' in Figure 18.12.

The generation process starts by traversing the system network of semantic features in Figure 18.16, for this is the configuration of probabilities assigned by GPR 'gp1' in (3) called by the feature 'with place description' of the genre structure plan in Figure 18.15. This traversal is suggested in **C1** of Figure 18.19. Let us now further assume that the microplanners interactively help the user make choices on the set of semantic options left open in Figure 18.16. One possible selection expression is the one suggested in the abbreviated output **O1**, where the relational attributive predicate *be'* has been selected.

The selection expression of semantic features in **O1** enters the realisation rule component **C2** so that the rules called by (some of) these features apply to derive a structure like the one shown in the output **O2**. Note that the realisation rules have created a sign whose meaning-face is the selection expression constructed in the traversal through the system network, and whose form-face is a clause. This clause is composed of a Ca(rrier) that has been conflated with a S(ubject), a M(ain) verb that has been conflated with an O(perator) that has in turn been expounded by *is*, and an At(tribute) that has been conflated with a C(omplement).

Some of the realisation rules in **C2** contain lower unit preference operations (cf. Section 18.2.2.1), i.e. preferences that are defined so that the system network of semantic features is entered again to specify the semantics of the Subject-Carrier (cf. **O3** in Figure 18.20), and the semantics of the Complement-Attribute (cf. **O5** and **O7** in Figures 18.21 and 18.22, respectively). Once these

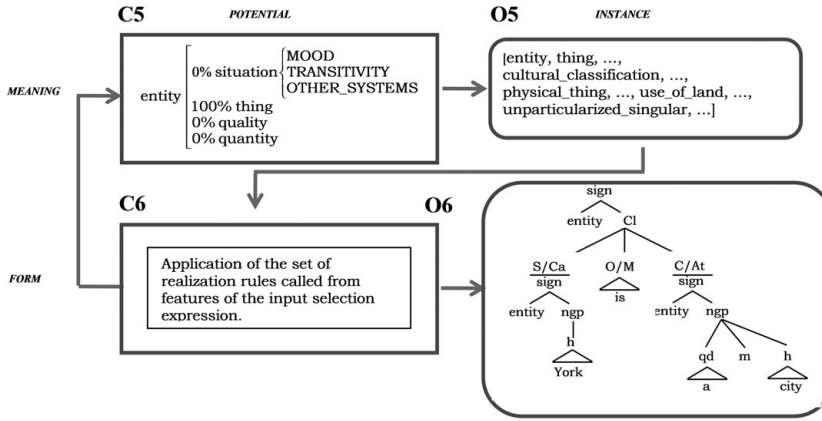

Figure 18.21. Sign constructed from selection expression resulting from third traversal through the system network called by Complement-Attribute

semantics are defined, the relevant realisation rules are called to derive the output structures **O4**, and **O6** and **O8** in Figures 18.20, 18.21 and 18.22, respectively.

Note that in the second and third traversals through the network (Figures 18.20 and 18.21) the feature 'thing' is assigned 100%, for that is what *York* and *city* are. These preferences are defined by lower unit preference operations of the relevant realisation rules called by features of the current selection expression. As for Figure 18.22, note that it corresponds to the fourth and last traversal of the system network. Note also that now 'quality' is the feature selected by a lower unit preference operation of a realisation rule called by the current selection expression.

The output sign in **O8** in Figure 18.22 is an abbreviation of the sign for *York is a fantastic city*. Figure 18.23 is the complete graph for this sign as it is generated by GeneSys_IDE when the modified version of the mini-grammar of EG is loaded.

Note that in Figure 18.23 the sign for *York is a fantastic city* (**1**) appears filling the terminal genre category 'with geographical traits' of Figure 18.15. Since the graph is too large to fit the page, it has been reduced with an unavoidable loss of legibility. We present it here anyway for the reader to appreciate the complexity of a fully explicit sign for a very simple sentence. Subgraph **0** is the genre structure in Figure 18.15 defined by traversing the genre network in Figure 18.14. The other numbers in Figure 18.23 point to the outputs **O1**−**O8** in Figures 18.19–18.22 in the following way. Subgraph **1** corresponds to the abbreviated sign in **O8**. Subgraph **1.1** is the structured version of the

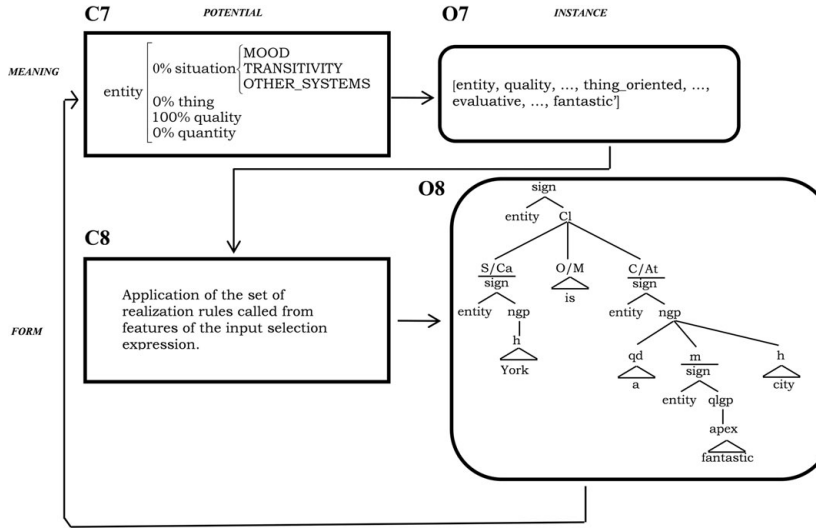

Figure 18.22. Sign constructed from selection expression resulting from fourth traversal through the system network called by 'm' (= modifier)

(abbreviated) list of semantic features in **O1**. Subgraph **1.2** corresponds to the abbreviated clause structure in **O2** constructed by **C2** as a realisation of **1.1**. Subgraph **2** corresponds to the abbreviated sign in **O4**, and is the result of applying the rules in **C4** called from the selection expression in **O3**; here, **2.1** is the structured version of the selection expression in **O3**, and **2.2** is the graph version of the nominal group structure in **O4**. Subgraph **3** represents the sign for *a fantastic city*, where **3.1** is the structured selection expression abbreviated as 'entity' in **O6**−**O8**, and **3.2** is the graph version of the nominal group in **O6**−**O8**. This nominal group contains a modifier (= 'm') that is filled by the subgraph **4**, which corresponds to the abbreviated sign in **O8** of Figure 18.22. Subgraph **4.1** is the structured selection expression abbreviated as 'entity' in **O8**, and **4.2** is the graph version of the quality group structure that realises such a selection expression.

The purpose of this example has been to show how genre-based preferences, defined in accordance with the CGF formalism presented in Section 18.1, can be implemented in GeneSys_IDE to allow for the generation of sentences within their natural contexts. This has been accomplished for a few semantic features involved in the first traversal through the system network of semantic features. Thus, **C1** of Figure 18.19 contains the system network in Figure 18.16, whose probabilities were set by applying the GPR 'gp1' in (3) to the system

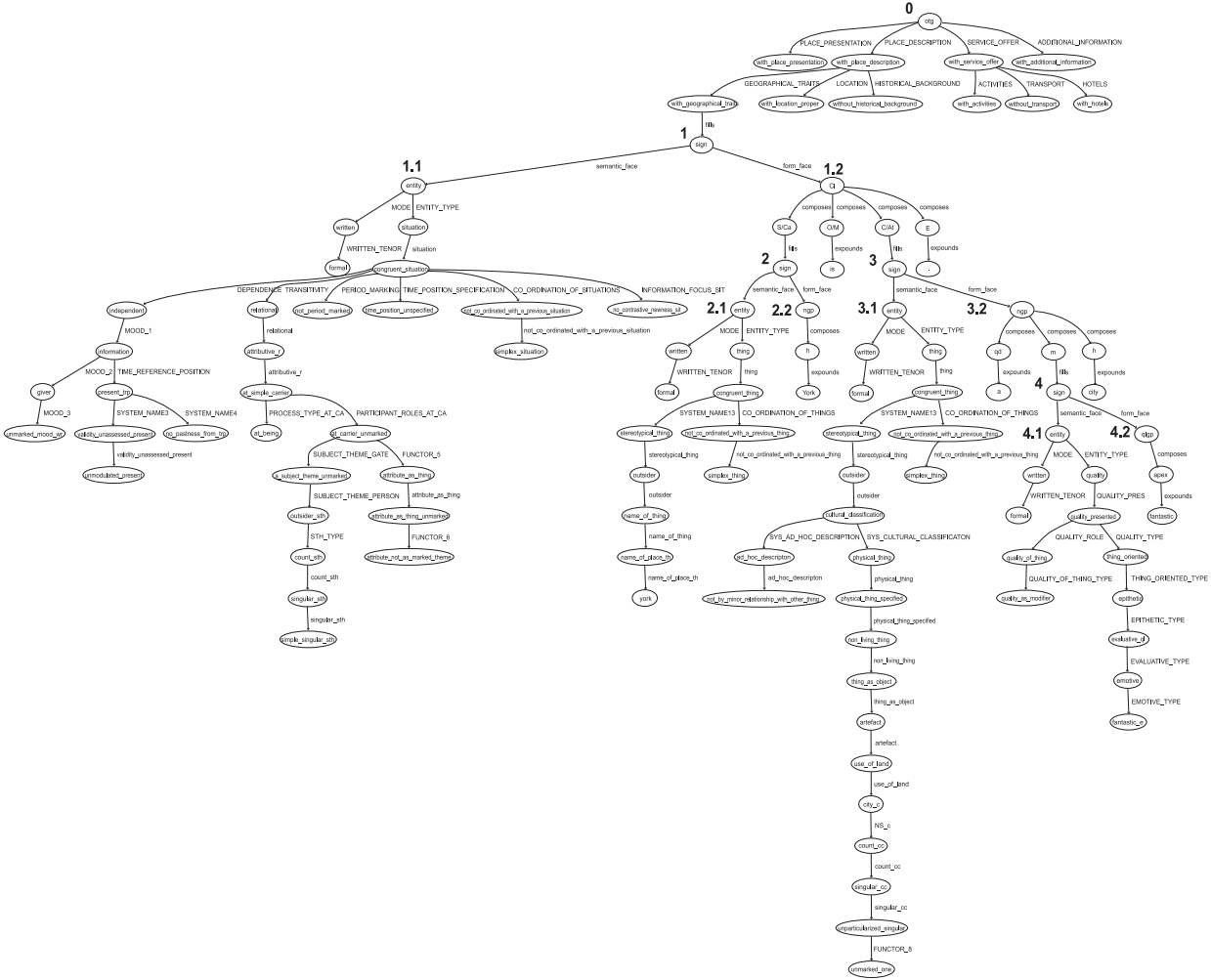

Figure 18.23. Sign for *York is a fantastic city* generated by GeneSys_IDE in the context of OTG

network of EG in Figure 18.11. The output selection expression abbreviated in **O1** (cf. **1.1** of the complete graph in Figure 18.23) results from choices made during the first traversal through the system network in Figure 18.16. **These choices were made on a significantly reduced set of semantic options**. This reduced set is the consequence of the GPR 'gp1' in (3) associated with the genre category 'with place description'. In work in preparation (Villar 2013, forthcoming), descriptive generalisations are being defined to attain a similar narrowing effect on the system networks in **C3**, **C5** and **C7**. Thus, microplannning of the semantics of the Subject-Carrier (cf. **O3** in Figure 18.17 = **2.1** in Figure 18.23), the Complement-Attribute (cf. **O5** in Figure 18.21 = **3.1** in Figure 18.23), and the modifier within the 'ngp' filling the Complement-Attribute (cf. **O7** in Figure 18.22 = **4.1** in Figure 18.23) can be carried out on sets of semantic choices that are significantly narrowed down by appropriate genre-based preferences.

Given that microplanning algorithms (see footnote 1) are involved in the interaction between the user and the generator, no 'decision problems' are posed to the NLG application. In fact, there will always be a choice on the semantic network made by the user (or the generator itself) that eventually leads to a 'selection expression' that in turn will be automatically associated with the relevant set of realisation rules leading to an adequate output.

18.4 Conclusions and future work

The need to enhance the CG generator GeneSys so that it can generate sentences in their natural contexts, i.e. texts, leads us to the well-established tradition in SFL according to which genre structure significantly constrains the class of linguistic signs available for expression within a given text type. Based on Villar's (2013, forthcoming) descriptive generalisations on the narrowing effects that the GSP of OTG has on the semantic potential of EG, we addressed the problem of determining how to accomplish this crucial task for text generation in formal terms.

The first step was to present the basic formal properties of the CGF semantic system network, focusing on two types of constraint, namely, same pass preference rule and lower unit preference operations. The task of same pass preference rules is to account for whatever co-ocurrence restrictions govern the probabilistic distribution of semantic features in a complete traversal of the network for a given semantic unit, e.g. 'situation'. The task of lower unit preference operations is to account for whatever co-occurrence restrictions govern the probabilistic distribution of semantic features in a traversal of the network for a given semantic unit, e.g. 'thing', on the basis of a configuration of features

existing in the selection expression resulting from a higher unit traversal of the network, e.g. 'situation'.

The second step was to present Villar's (2013, forthcoming) descriptive generalisations on the constraining impact that genre properties of a given text type, namely OTGs, have on the probabilistic resetting of the semantic potential of EG as this is defined in the CGF. This presentation was made in accordance with the CGF formal properties discussed in Section 18.2, i.e. the genre-driven constraints imposed by OTGs on the CG semantic system network of EG were defined using the CFG formalism. This in turn implied two specific moves: (i) defining the GSP of OTGs as a system network of genre features, and thus as a network that can be constrained by resorting to the CGF same pass preference rule formalism; and (ii) defining OTG-driven constraints on the semantic system network of EG in terms of the lower unit preference formalism, i.e. GPRs.

The resulting formalisation of the probabilistic resetting of the semantics of EG on the basis of the OTG constraints was implemented so that now the CG generator generates not only isolated sentences but also sentences in their natural contexts. This implied incorporating a system network for genre features of OTG whose function is to define a class of possible OTG genre structure plans (cf. Figure 18.1).

Finally, an example of generation was given which illustrated how the implementation of the genre-driven constraints can account for the generation of a sentence like *York is a fantastic city*, as the sign associated with a terminal genre feature of a specific OTG genre plan instance. The GPR 'gp1' in (3) narrowed down the scope of the semantic choices available for selection on the part of the user of GeneSys_IDE by resetting the probabilities of the semantics of EG into the probabilities of the semantics of the English of OTG. Similar GPRs were defined for other genre features of the given OTG genre plan, for each terminal genre feature will be associated with the relevant preferences.

The significance of this enhancement of GeneSys is that sentence planning can now also be defined so that it is sensitive to the semantic potential of EG as this is restricted by the GPRs of specific genres. This genre-based narrowing down of semantic choice appears to be an important contribution to the generation of sentences within their natural contexts. We foresee that we are closer to modelling the constraining effects that a given realisation of a genre constituent, i.e. a sign, has on the semantic choices available for the following and/or preceding genre constituent(s), and thus on the planning of their realisation. GeneSys_IDE now has the formal resource to do so, though the relevant descriptive generalisations are yet to be found.

Appendix

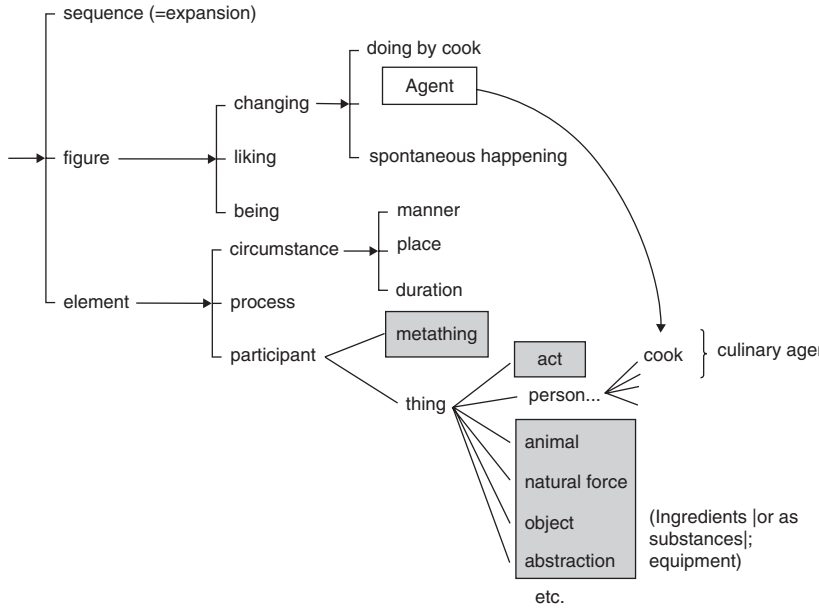

Figure 18.A1. Subtypes of agent as constrained by the domain of recipes (this figure corresponds to 'Fig. 11–16: The culinary notion of agent', extracted from Halliday & Matthiessen, 1999:361)

Part V

Interpreting Choice

19 Choices in analysing *choice*: methods and techniques for register analysis

Elke Teich

19.1 Introduction

Choice is a central concept in Systemic Functional Linguistics (SFL), acting as the fundamental metaphor for what we do as language users.[1] Apart from its use for representing options or terms in the linguistic system, choice is used to denote the process of choosing as well as the result of that process.[2] As systemic linguists we make a choice of which of these choices we want to investigate: in language description, we engage in *choice-as-option*, i.e. we model the lexicogrammatical system of a given language (see e.g. Halliday & Matthiessen, 2004; Matthiessen, 1995, for descriptions of English); in text analysis, we engage in *choice-as-result*, e.g., we analyse instances of a given register (see e.g. Ure, 1982; Halliday, 1985; Halliday & Hasan, 1989; Ghadessy, 1993); in applications of SFL to 'real-world problems', we engage in *choice-as-process*, such as the study of language development (e.g. Halliday, 1975; Martin & Hasan, 1989), translation (e.g. Steiner & Yallop, 2001; Teich, 2003; Neumann, 2009) or automatic text generation (e.g. Matthiessen & Bateman, 1991).

The focus of the chapter is on the methodological and technical choices we have for studying *choice-as-result*, i.e. text analysis. One of the primary concerns in SFL-based text analysis is register, i.e. linguistic variation according to situational and cultural contexts. As registers are characterised by clusters of linguistic features which have a greater-than-random tendency to occur (Halliday & Martin, 1993:54), register analysis is inherently quantitative in that it provides statements about frequencies as well as probabilities. Also, it is comparative in that feature frequencies/probabilities are interpreted as relatively high or low in contrasting two or more registers. Thus, for its results

[1] I wish to thank my collaborators in the compilation of and work on the DaSciTex corpus, especially Sabine Bartsch, Peter Fankhauser, Monica Holtz, Richard Eckart and Stefania Degaetano. The research reported on in this chapter was funded by *Deutsche Forschungsgemeinschaft* (DFG) under grant TE-198/1. Work on the diachronic extension of the corpus and its analysis is currently being funded under grant TE-198/2.

[2] See Berry (this volume) for a similar classification.

to be valid, register analysis must be based on sufficient amounts as well as suitable types of linguistic data.

The ultimate goal of the chapter is to propose a basis for a computationally enhanced methodology to SFL's theory of register variation, raising awareness about some standard computational techniques for corpus processing as well as data analysis that are deployable in the service of register analysis. Taking as a basis a number of corpus-based studies carried out in the last few years in the area of scientific writing (Teich & Holtz, 2009; Teich & Fankhauser, 2010; Teich & Degaetano-Ortlieb, 2011; Holtz, 2011), we discuss typical issues involved in corpus-based register analysis, ranging from corpus design, hypothesis formulation and data interpretation at the methodological level to corpus preparation (automatic and manual annotation), data extraction and data analysis at the technical level (Sections 19.2 and 19.3). We conclude with a summary and an outlook on future work (Section 19.4).

19.2 Register variation in contemporary scientific writing: corpus design and processing

Our overarching research interest is in lexicogrammatical choice according to situational context, focusing on register diversification in contemporary scientific writing, and in the methods of modelling this choice. In particular, we consider the situation in which scientific disciplines come into contact with computer science, possibly forming a new (interdisciplinary) field. We focus on four such fields that have emerged in the second half of the twentieth century: computational linguistics, bioinformatics, digital construction and microelectronics. The linguistic research questions we are interested in are of the following kind: What are the linguistic effects of a discipline coming into contact with computer science? To what extent do the linguistic characteristics of the discipline of origin propagate to the newly emerging discipline? To what degree are the linguistic conventions of computer science adopted? When can we speak of a new, distinctive register?

In order to investigate these questions, we have built a corpus consisting of research articles from nine disciplines, including texts from the four interdisciplinary areas mentioned above, their corresponding disciplines of origin (linguistics, biology, mechanical engineering, electrical engineering) and computer science (the *Darmstadt Scientific Text Corpus*, short: DaSciTex; cf. Teich & Holtz, 2009; Teich & Fankhauser, 2010), all published in the early 2000s. Figure 19.1 displays the design of the corpus.

Altogether the corpus contains approximately 17 million words. It has been processed with some standard computational-linguistic methods such as sentence segmentation, tokenisation, lemmatisation and part-of-speech (PoS) tagging (cf. Teich, 2009). For an example of linguistic annotation see

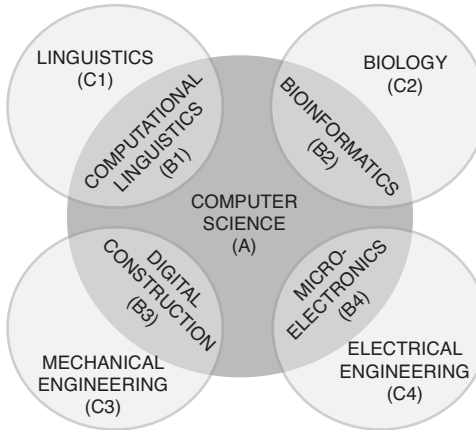

Figure 19.1. Design of DaSciTex

token	lemma	PoS
this	this	DT
algorithm	algorithm	NN
assumes	assume	VBZ
that	that	IN
we	we	PRP
know	know	VBP
the	the	DT
exact	exact	JJ
value	value	NN

Figure 19.2. Example of annotation (1)

Figure 19.2. At a meta-level, the corpus is encoded for bibliographical data as well as settings of the contextual variables of field, tenor and mode.

The corpus can be queried by means of standard corpus tools (e.g. concordance programs) as well as annotated further in terms at additional, possibly more abstract levels. The adopted representation of the corpus and its annotations makes it possible to integrate/align various levels of annotation, thus forming a 'multi-layer' corpus (cf. Eckart & Teich, 2007). For example, it is possible to add a functional annotation (e.g. using UAM Corpus Tool; O'Donnell, 2010), which can be aligned with the other annotation layers by means of standoff mark-up. For an example see Figure 19.3. Here, the corpus is segmented in terms of character offsets (e.g., the phrase 'this algorithm' starts with character 1 and ends with character 14) and all annotations are assigned to these character offsets (the format actually used is XML).

token	lemma	PoS	segment	process type, PRs
this	this	DT	1…	Senser
algorithm	algorithm	NN	14	
assumes	assume	VBZ	16…22	Mental_process
that	that	IN	24	Phenomenon
we	we	PRP	…	
know	know	VBP	…	
the	the	DT	…	
exact	exact	JJ	…	
value	value	NN	54	

Figure 19.3. Example of annotation (2)

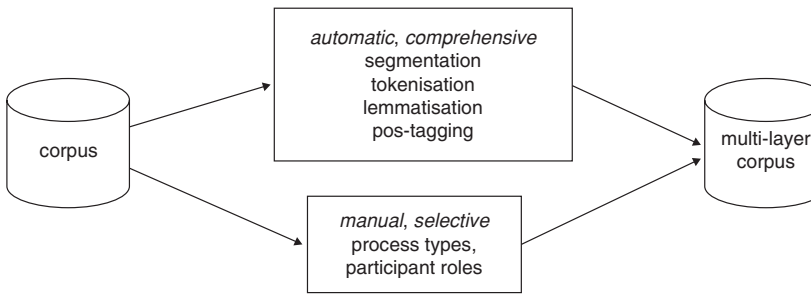

Figure 19.4. Processing pipeline for corpus annotation

What is characteristic of this particular method of corpus processing is the combination of automatic and manual annotation. While the whole corpus has been segmented (sentences), tokenised (character strings), lemmatised and tagged (parts-of-speech) automatically, only selected segments (clauses) have been annotated manually in terms of functional categories (e.g. process types, participant roles) with dedicated annotation tools. Figure 19.4 displays our processing pipeline.

The corpus is then ready for analysis. In Section 19.3 we first present the principal steps in corpus analysis and then show selected analysis examples.

19.3 Methods and techniques of corpus-based register analysis

The first step in a register analysis is to identify features that will bring out register differences (provided they exist). In principle, for register analysis all lexicogrammatical features are potential candidates, as registers are realised by the frequency of occurrence of (particular) lexicogrammatical features. *Feature selection* can thus be completely unguided or it can be driven by some prior assumptions about the kinds of features that will be characteristic of a

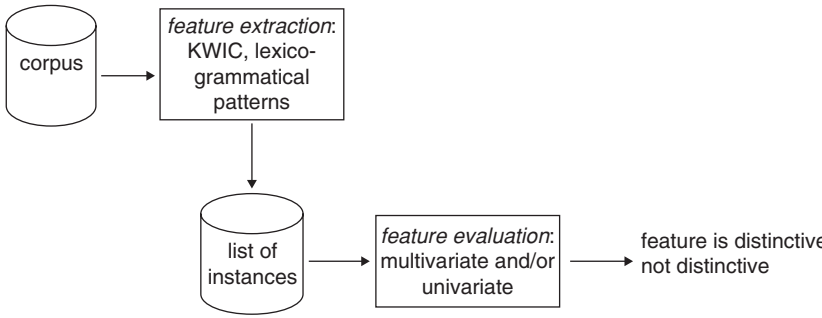

Figure 19.5. Processing pipeline for corpus analysis

given register. Here, we pursue the latter approach. The features chosen for analysis can be functional (process type, theme, mood, etc.) or surface (word lists, parts-of-speech, etc.). According to SFL, for a given register, we would expect distinctive feature distributions at the functional level. However, register differences may also manifest themselves at more shallow levels of linguistic organisation. Among the features that have been attested as typical of scientific writing are the (relatively) frequent use of nouns, relatively high lexical density and relatively low type−token ratio (cf. Biber *et al.*, 1999; Biber, 2006). Considering highly specialised registers, as in our analysis scenario, we face the particular challenge of differences being rather subtle. In our experience, it is not sufficient to consider functional-grammatical features and/or surface-grammatical ones, since they tend to be distributed rather evenly for scientific writing sui generis. Rather, differences typically lie in the area of colligation, i.e. in patterns of mutual attraction of lexemes and (types of) grammatical constructions. Thus, as candidate features for register diversification we mainly consider the latter, while for discrimination of scientific writing as a 'meta-register' we mainly consider shallow features such as type−token ratio (TTR), lexical density and PoS distributions.

Once a set of candidate features has been determined, the next steps are to extract them, i.e. to identify instances of these features in the corpus and to quantify them, and to interpret the feature frequencies attained in terms of their discriminatory effects according to register. We refer to these steps as *feature extraction* and *feature evaluation*. Figure 19.5 displays the processing pipeline for these steps.

Feature extraction can be carried out with a number of techniques ranging from KWIC (keyword-in-context) concordancing (as offered, for example, by UAM Corpus Tool) to programming environments geared to linguistic and quantitative analysis, such as the Natural Language Tool Kit (NLTK; Bird *et al.*, 2009) or R (Gries, 2009), as well as data-mining platforms, such as RapidMiner

(Mierswa *et al*., 2006) or WEKA (Witten & Eibe, 2005). The choice of tool depends on the nature of the selected feature (word, annotation category) on the one hand, and on the method of feature evaluation to be employed on the extraction result on the other hand. Some of the tools mentioned support both extraction and evaluation (in data mining, for instance, the two steps are typically integrated). The result of feature extraction is a list of instances from the corpus together with their frequencies of occurrence. In the simplest case, this is a word list; other types of instances are phrases or clauses exhibiting a particular lexicogrammatical pattern or functional feature (e.g. process types, agency, etc.). For examples see Section 19.3.1 below.

Feature frequencies then need to be evaluated in terms of the initial analysis question. In register analysis, this is always the question of the discriminatory effect (if any) of a given feature or set of features (cf. Berry, this volume). If one feature is considered at a time, the appropriate means are univariate methods, i.e. statistical tests on a feature distribution (e.g. *t*-test, chi-squared test). However, more often than not, features are correlated and we want to assess exactly this correlation (in SFL terms, we may call this 'co-choice'). This means that we have to consider more than one feature at a time. To evaluate sets of features, multivariate methods have to be employed. These can be explorative (e.g. factor analysis, principal component analysis, clustering) or confirmatory (e.g. regression analysis).

19.3.1 Examples of analysis

We now show selected analyses of the DaSciTex corpus going through the three steps of corpus analysis outlined above, thus illustrating particular techniques of data analysis. We investigate two types of question:

- How well is the DaSciTex corpus distinguished as 'scientific writing'?
- How different are the subcorpora of DaSciTex in terms of individual registers?

We have investigated the first question comparing DaSciTex to the FLOB corpus (Mair, 2006), a registerially mixed corpus containing text extracts from fifteen areas, including religion, government, science and literature (cf. Teich & Fankhauser, 2010 and Section 19.3.1.1 below). Regarding the second question, we have carried out a number of analyses comparing the subcorpora of DaSciTex in terms of various features relating to field, tenor and mode of discourse, two of which are shown in Sections 19.3.1.2 and 19.3.1.3.

19.3.1.1 Example 1: features of scientific writing

Scientific writing is said to be characterised by (high degrees of) technicality, information density and abstractness (cf. Halliday & Martin, 1993). Among

Table 19.1. *Results of comparison: DaSciTex vs. FLOB´*

	DaSciTex	FLOB´	*t*-test	SVM
standardized TTR	34.0	45.3	29.5	
ADV	0.034	0.060	23.8	
N	0.33	0.27	−19.0	97%
lexical density	8.39	5.76	−18.4	
V	0.097	0.12	12.2	

Single features: *t*-test; set of all features: SVM classifier

the linguistic features realising these properties are a relatively low type−token ratio, a relatively high lexical density and the frequent use of nouns (including nominalisation) (cf. also Biber's work on the dimension 'involved vs. informational production'; e.g. Biber, 1988, 1993).

Since we consider more than one feature, possibly correlated, we need to apply a multivariate technique for evaluation. The basis for analysis is the DaSciTex corpus (tokenised and PoS-tagged) and the FLOB corpus[3] which we tokenised and PoS-tagged as well. The corpora were then imported into the WEKA data-mining platform for the steps of feature extraction and evaluation. We tested each feature on its own using Welch's *t*-test, and, more importantly, we applied a support vector machine (SVM) classifier to the whole set of features (twelve features) considered.[4] The results are displayed in Table 19.1 (cf. Teich & Fankhauser, 2010), showing the five most distinctive features only.

Interpreting the *t*-test, this means that DaSciTex has a significantly lower TTR and lower number of adverbs and verbs than FLOB´ and a significantly higher lexical density per clause as well as a significantly higher number of nouns compared to FLOB´. Taken together, these are the five most distinctive features. According to the classification result, which is rather good with 97 per cent, of the 186 texts contained in DaSciTex only eight were incorrectly classified as belonging in FLOB´ and only nine of the 297 texts contained in FLOB´ were mistakenly classified as belonging in DaSciTex on the basis of the twelve features considered (see Table 19.2).

[3] We excluded the J section (academic) from the analysis in order to have a comparable corpus without scientific English as well as the H section (government) which was quite close in some linguistic patterns to scientific English. The modified corpus is henceforth called FLOB´.

[4] A support vector machine is a machine-learning method which takes as input a set of data or features and predicts, for each feature, which of two possible classes it is a member of (cf. Cortes & Vapnik, 1995).

Table 19.2. *Confusion matrix DaSciTex – FLOB´*

C\P	DaSciTex	FLOB´	No. of texts: total
DaSciTex	178	8	186
FLOB´	9	288	297

C: class P: class predicted by SVM Classifier

DaSciTex thus appears to be well distinguished as 'scientific writing' compared to non-scientific language in terms of the given features.

The two analyses in Sections 19.3.1.2 and 19.3.1.3 deal with the question of the distinctive register properties of the interdisciplinary fields contained in DaSciTex (i.e. computational linguistics, bioinformatics, digital construction, microelectronics) (cf. Figure 19.1 above).

19.3.1.2 Example 2: register differences in field of discourse

Looking for possible distinctive features of interdisciplinary discourses at the boundaries of computer science involves comparing the computer science subcorpus of DaSciTex (A) with the subcorpora of the interdisciplinary fields (B) and the subcorpora of the disciplines merging with computer science (C) (see again Figure 19.1).

As stated above, candidate distinctive features are best looked for in the area of colligation. For field of discourse, it is the nouns that are the prototypical carriers of experiential information. We thus decided to investigate the colligation behaviour of selected nouns. On the basis of the PoS-tagged version of DaSciTex we extracted all the nouns. The choice of nouns was done on the basis of frequency. Among the most frequent nouns in DaSciTex is the noun *algorithm* (cf. Teich & Holtz, 2009), which at the same time is a typical noun in computer science. The analysis goal was to see whether the interdisciplinary fields (B subcorpora) adopt the patterns of usage of the noun *algorithm* from computer science (A subcorpus) or whether they create their own patterns of usage. We considered noun–verb colligation (here: *algorithm* + Verb). Feature extraction was carried out employing the Corpus Query Processor (CQP; Christ, 1994), which supports regular expression searches on strings and annotation categories (such as PoS). This gives us lists of instances matching the extracted pattern. We then extracted the corresponding clauses, filtered out the ones in which *algorithm* does not assume a syntactic function at clause level, and annotated the remaining ones with process types (material, relational, verbal, mental, etc.) according to Halliday and Matthiessen (2004) using UAM Corpus Tool. For some examples from the computer science subcorpus (A) see (1)−(3).

Table 19.3. *Results of comparison A subcorpus vs. B subcorpora*

Subcorpora	Chi-squared	*p*-value
A−B1	29.690	1.679e-05
A−B2	40.973	9.498e-08
A−B3	29.756	1.647e-05
A−B4	33.771	2.644e-06

A: computer science
B1: computational linguistics, B2: bioinformatics,
B3: digital construction, B4: microelectronics

(1) . . . there is a centralized polynomial algorithm that works in the spirit of LIS.
(2) Obviously, randomised algorithms for metric spaces of small aspect ratio can be obtained by first embedding it into a uniform space . . .
(3) . . . we design an adaptive algorithm that transmits a message from an arbitrary location in the system to a boundary unit . . .

In (1), *algorithm* is involved in an existential clause (main clause) as well as in a relational clause (embedded relative clause). (2) is a material clause in which *algorithm* acts as Goal; and in (3) *algorithm* is a Goal in a material clause (main clause) as well as an Actor in a material clause (embedded relative clause).

Based on the distributions of the feature 'process type', we pairwise compared the A subcorpus with all B subcorpora (B1−B4) using the chi-squared test to test for significance. The results are significant for all four pairs (see Table 19.3).

This means that there is a non-random difference in the distribution of process types comparing the A subcorpus with the B subcorpora. Looking at the concrete feature values, in A and B1–B4, material and relational processes make up approximately 80 per cent of all process types choices, but in A and B4 50 per cent are material, whereas in the other B subcorpora, material and relational are more evenly distributed, each taking up around 35 per cent (see Teich & Holtz, 2009).

If we test for the relation of the B with the C subcorpora, the results are significant for B4 vs. C4, but not significant for all other pairs (see Table 19.4). Taken together, this can be interpreted as the interdisciplinary fields (B subcorpora) creating their own variation compared to computer science (A subcorpus) while being non-distinct from their disciplines of origin (C), except for microelectronics (C4). For more results see Teich and Holtz (2009).

Table 19.4. *Results of comparison B subcorpora vs. C subcorpora*

Subcorpora	Chi-squared	*p*-value
B1−C1	7.883	0.163
B2−C2	2.073	0.839
B3−C3	3.423	0.635
B4−C4	15.563	0.008

B1: computational linguistics, B2: bioinformatics, B3: digital construction, B4: microelectronics
C1: linguistics, C2: biology, C3: mechanical engineering, C4: electrical engineering

19.3.1.3 Example 3: register differences in tenor of discourse

In the area of tenor of discourse, we looked at selected expressions of stance, following the approach proposed by Hunston and Francis (2002). Even though scientific writing is generally said to be objective, it does contain assessments of the *probability*, *importance* and *complexity* of states and events (cf. also Hunston & Thompson, 2003). One pattern we investigated is the 'it is ADJ to' pattern (cf. Teich & Degaetano-Ortlieb, 2011). We extracted instances matching this pattern from all subcorpora of DaSciTex again using CQP. For some examples see (4)−(6).[5]

(4) . . . so it is likely to have an independent function.
(5) It is important to evaluate the winglets . . .
(6) It is difficult to say how many nouns fall into this category.

The results were grouped into the three categories of *probability* (4), *importance* (5) and *complexity* (6) and the feature distributions were tested with the chi-squared test, again pairwise comparing A with all B subcorpora and all B subcorpora with their corresponding C subcorpora. From the perspective of the B subcorpora, the results are significant for all four pairs compared to A. Here, the prominent choice in the interdisciplinary fields is the *importance* pattern, whereas computer science favours the *complexity* pattern. Compared to the C subcorpora, we get a mixed picture for the B subcorpora with significant differences for B1–C1 and B4–C4 and no significant differences for B2–C2 and B3–C3. Here, we can observe a proliferation of the *importance* pattern in B4 (microelectronics) and of the *complexity* pattern in B1 (bioinformatics). Again, similar to the results of the analysis shown in Section 19.3.1.2, the interdisciplinary fields are clearly distinct from computer science,

[5] In this pattern, *it* is typically an empty Subject, as in examples (5) and (6). Note that we have also included cases with *it* being referential, as in example (4).

while we encounter a mixed picture comparing them to their disciplines of origin.

19.3.2 Some principles of corpus-based register analysis

The angle from which we approach register analysis in our work is to consider it a task of text classification (cf. Sebastiani, 2002): given a set of texts (a corpus), how do the individual texts or subsets (subcorpora) group with regard to a given (set of) feature(s)?

Taking this perspective puts us into a position in which we can use a range of methods for data analysis that can suitably be employed for the purpose of register analysis.[6] At a technical level, to work with these methods various types of support are available, ranging from simple descriptive statistics (e.g. Excel) through dedicated tools for more complex statistical computing (such as the R suite of tools) to data-mining platforms (such as WEKA). At a conceptual level, taking the perspective of text classification allows us to make out three (conceptual) steps in register analysis – feature selection, feature extraction and feature evaluation. Taking these steps as the basis, we can advance the following methodological principles for a computationally supported, systemic functionally based register analysis:

1. *Feature selection*. Relevant features for register discrimination must be determined. Potentially, all lexicogrammatical features can act as register discriminators. However, a comprehensive lexicogrammatical analysis is very time-consuming and might not produce appropriate data, especially for highly specialised registers. It is thus advisable to use selected features only. Features are chosen according to their relevance for a given analysis task and with a view to ease of extraction. This means that we have to make some compromises regarding the level of analysis, which needs to be pushed away from the functional, paradigmatic to the surface, syntagmatic axis and from the grammatical to the lexical end of the grammar−lexis cline (see Section 19.3.1.2 above). 'Feature' thus means *lexicogrammatical syntagmatic pattern* as a realisation of a more abstract, paradigmatic feature (where there is typically more than one such realisation).[7]
2. *Feature extraction*. Instances of the selected features must be identified and extracted. We can conceive of the task of feature extraction in the traditional corpus linguistic sense as *corpus search* in which we define a search pattern and obtain a concordance list as output. However, more often than not, we will consider this step not so much as the ultimate analysis

[6] Compare also Biber, who has advocated and used various multivariate methods since the late 1980's / early 1990's (Biber 1988, 1993).

[7] Halliday (personal communication) refers to these realisations as "outcomes of choice".

Table 19.5. *Steps of analysis, methods and techniques*

Step of analysis	Feature selection	Feature extraction	Feature evaluation
Method	comprehensive vs. selective	automatic vs. semi-automatic	univariate vs. multivariate
Technique	human observation vs. by machine	dedicated corpus-linguistic and mining tools	general statistical vs. dedicated statistical/ mining tools

but as one of *corpus exploration*: we start with a particular feature (i.e. lexicogrammatical syntagmatic pattern), extract instances of it, and then, inspecting the results, discover additional (and possibly more complex) patterns. We can then use the additional patterns discovered for further analysis, discover additional patterns, and so on, thus proceeding in cycles of feature selection and feature extraction. Feature selection and extraction thus constitutes an iterative process which may be stopped when we find no new patterns that realise the paradigmatic, more abstract feature from which we started.[8]

3. *Feature evaluation*. Finally, the discriminatory effects of the selected features have to be assessed on the basis of the frequency distributions we attain through extraction. This step is one of *data analysis*. Here, we may want to consider one feature at a time or assess two or more features (which are possibly correlated) simultaneously. For the first, univariate methods of analysis are suitable; for the second, we need multivariate methods. More often than not, however, we will be interested in the collective contribution of a set of features to register formation as well as the importance of one feature relative to another in bringing out a register distinction. For this, only multivariate methods are suitable. Evaluating features in this way is an essential step towards modelling the probabilistic nature of choice.

Table 19.5 summarises the options in methods and techniques according to each step.

In summary, considering register analysis as a text classification task, we arrive at a transparent conceptualisation of the concrete steps involved in analysis and hence a much clearer picture of the kinds of methods needed, including suitable empirical−statistical techniques. The main lesson to be learned from experimenting with different methods and techniques of data analysis is that univariate and multivariate (including machine-learning) methods each have

[8] This kind of approach – starting with a (simple) pattern that acts as a seed activating additional (possibly more complex) patterns which can then be used for further processing – is also known as *bootstrapping* in machine learning.

their place in the overall methodology. However, when it comes to assessing the collaborative effects of features, only those methods will provide us with answers that are able to detect correlations of features as well as rank features in terms of their discriminatory strengths.

19.4 Summary and envoi

In this chapter, we have been concerned with methodological and technical choices in register analysis. We have shown how to combine a systemic functionally based approach with state-of-the-art corpus processing and data analysis using selected examples of analysis carried out in the last few years on a corpus of English scientific research articles, the DaSciTex corpus (see Section 19.3.1). In the first analysis example, we showed that DaSciTex is representative of scientific writing according to a number of features, including (a relatively low) type−token ratio and (a relatively high) lexical density. For feature evaluation, we applied multivariate methods known from data mining. In the second and third examples, we tested for register diversification of the different academic disciplines contained in DaSciTex in terms of selected features from the field and the tenor of discourse. The method we applied for feature evaluation was a univariate one (chi-squared test). Here, the tendency revealed by the analyses is for the interdisciplinary fields (B subcorpora) to create their own variation compared to computer science (A subcorpus), while compared to their disciplines of origin (C subcorpora) we do not get a uniform picture.

On the basis of the experience gained in corpus-based register analysis as illustrated by the examples, we have proposed some methodological principles for the analysis of *choice-as-result* relying on some state-of-the-art techniques of data analysis (Section 19.3.2). Currently, we are exploring selected features of the mode of discourse (notably Theme−Rheme organisation) as well as additional features of field and tenor. We are thus growing the feature set investigated incrementally until we obtain a large enough set to apply automatic classification (as shown in Section 19.3.1.1) so as to be able to test for correlations between features and to determine the most distinctive features. In a follow-up project, we have built up a comparable, diachronic corpus to DaSciTex with texts from the 1970s/1980s (Degaetano-Ortlieb *et al*., in press), on the basis of which we investigate the diachronic linguistic development of the four interdisciplinary fields represented in the corpus.[9]

In our work on register, we generally make two assumptions about the nature of choice: choice is based on *difference*, and choice has a *probabilistic character*. For the analysis of texts/corpora (*choice-as-result*) this means that it must

[9] Cf. also Banks (2008) for a systemic functional study of the diachronic development of English scientific writing.

be comparative and focus on difference since it is the differences that tell us about choice (see Berry, this volume). For modelling choice, this means that statements about the differential distribution of features form the basis for modelling lexicogrammar as a probabilistic system (see also Freddi, this volume, who reviews the theoretical basis of choice and language variation), where the probability of choice of a given feature (or set of features) is conditional on context (situational as well as syntagmatic contexts). If we are convinced that choice is ultimately to do with contextually conditioned probabilities, then we will have to seriously engage in statistically based language modelling (see e.g. Charniak, 1993; Manning & Schütze, 1999).

Furthermore, more research concerning methodological issues has to be carried out in two regards. One concerns the *interpretation of results* at a more abstract level. While a contrastive account of registers in terms of frequencies/probabilities of occurrence of lexicogrammatical features is valuable in itself, another goal of a register analysis is an interpretation of the quantitative data in terms of (situational/cultural) context (see also Miller & Johnson, this volume). As language users we make assessments of texts in terms of abstract properties, such as 'this text is technical' or 'this text is informationally dense'. As linguists we then ask: What are the linguistic indicators of such abstract properties? On what basis can texts be classified as (more or less) technical or (more or less) informationally dense? And how can we model the relation between abstract properties of a discourse and lexicogrammatical features? In the present context, we would like to know how interdisciplinary scientific fields that emerge through contact of an established scientific discipline with computer science construe themselves linguistically. We may start with an observation about a text, such as 'the text is abstract', 'the text is mainly experientially construed' and then look for concrete linguistic features of realisation at the level of lexicogrammar that are indicators of these more abstract properties of a discourse, and then form a hypothesis about the distribution of the features selected. Once we have determined the features to be investigated, the task is one of analysis and we can proceed to use the commonly employed methods of corpus analysis, as shown in this chapter. But often, it may be difficult to find the relevant features. In this case, we face a different problem which can be characterised as one of *feature discovery*. To handle it, we need computational tools that support human observation so that we can detect new features, correlations between them and, ultimately, the abstract discourse properties that they realise. We therefore need to explore additional methods of data exploration as they have recently been developed in information processing (e.g. latent semantic analysis, topic models) and adapt them to application for linguistic inquiry.

The second and a related issue is the accessibility of computational techniques for corpus processing and data analysis. There are quite a few dedicated

tools available that each serve a different function (e.g. annotation, corpus search, data mining, statistical analysis, etc.). It is currently still problematic to integrate these into one processing pipeline for various reasons, one being different input/output formats. To provide infrastructures for creating such pipelines is currently a much researched topic in Digital Humanities. As the awareness of the necessity of such infrastructures is growing, there is increasing national and international support of collaborative projects concerned with devising and implementing them. This is witnessed, for instance, by the European DARIAH and CLARIN projects,[10] which will make available various kinds of computational support for research in the arts and humanities, thus enabling researchers in linguistics and other humanities disciplines to develop sounder, empirically based methodologies.

[10] Digital Research Infrastructure for the Arts and Humanities <www.dariah.eu>; Common Language Resources and Technology Infrastructure <www.clarin.eu>.

20 'Register-idiosyncratic' evaluative choice in Congressional debate: a corpus-assisted comparative study

Donna R. Miller and Jane H. Johnson

> A corpus . . . is a treasury of acts of meaning which can be explored and interrogated from all illuminating angles, including in quantitative terms.
> (Halliday, 2002d:406)

20.1 Introduction: locating the research

This chapter reports select findings of our continuing investigation into 'probabilistic' (Halliday, 1991) evaluative and speaker-positioning *function bundles* (Halliday, 2002c:262) in the sub-variety of political discourse: US Congressional speech.[1] Our specially created corpus of nearly 1.5 million words – further described in Section 20.2 below – consists of speeches of the US House of Representatives on the homogeneous topic of the Iraq war. The chapter provides results of co-textual analysis in the environment of collocant *must*.

In recent years, linguistic research has focused on the possibly 'register-idiosyncratic' (Miller & Johnson, 2009) significance of the lexicogrammatical bundles/clusters which speakers choose to realise. Biber and Conrad (1999) examine these in conversation and academic prose; others, such as Partington and Morley (2004), look at how patterns of metaphorical lexical bundles construe ideology in newspaper editorials and news reports; Goźdź-Roszkowski (2006) classifies lexical bundles in legal discourse; and Morley (2004) examines their evaluative discourse-marking function in newspaper editorials. Yet, despite "the important correlation between lexicogrammatical choice and register . . . It is also an observable fact that certain systemic choices strongly influence others at a more local level and irrespective of register variety" (Tucker, 2007:963). And, as Hasan reminds us, at the extralinguistic level, "contexts of life cannot but be permeable" (Hasan, 2000:43). In short, the likelihood of patterns of sequences *not* being absolutely 'register-idiosyncratic' must also be kept in mind.

[1] Although this chapter is the product of continuous co-operative research and writing, qualitative parts may be largely attributed to Miller, while quantitative parts are to be credited to Johnson.

We now turn to the issues at stake and the research questions posed. This will be followed by a rundown of the methodology employed and the theory driving it, and an outline of the overall 'Contextual Configuration' of the text collection. In Section 20.2, the design of our corpus and reference corpora is described, along with some noteworthy comparative data. Section 20.3 introduces the study and Section 20.4 reports our findings. Some closing remarks are offered in Section 20.5.

20.1.1 The issues – research questions

This investigation continues long-ongoing research into register-idiosyncratic features of evaluation and stance in institutional deliberative debate (cf. Miller, 2007). In terms of the choices that speakers make within the meaning potential present in the system, register-idiosyncratic choice is made within a "meaning potential [that] can be represented as the range of options that is characteristic of a specific situation type" (Halliday, 1978b:109). We equate this specific situation type with register, defined "as the local resetting of the global probabilities of the system" (Halliday, 2002d:408) that is due to situation-specific *conditionalisation* (Matthiessen, 1993). In short, certain contexts typically oblige certain meanings and wordings to be made (cf. Thompson, 2004:39). And with 'contexts' we include 'context of culture', as speaker choice must be interpreted at all levels.

Moreover, the ways debaters interact and discursively position themselves vis-à-vis one another in the course of their 'deliberate dispute' (Adams, 1999) can be seen to be the result of register skewings which are motivated by differences in 'registorial repertoires' (Matthiessen, 1993). We see such skewing in Congressional debate as being primarily a question of tenor-oriented interpersonal prosodies (Martin, 1992). Thus divergences/convergences according to gender, ethnicity and political party affiliation are also probed, in an attempt at better interpreting the *interdependence* and *variability* of linguistic choices within a register.

Our aims centre on seeing: (i) whether the chosen linguistic patterns, hypothesised as instantiations of register-idiosyncratic semantic probabilities, do prove statistically 'salient'; (ii) how the semantic prosodies enacted in the Congressional corpus compare to that in the reference corpora; (iii) whether, as has emerged in past studies (e.g. Miller, 2007), these patterns can be seen to be, typically, not only multiple, but also densely intertwined and interdependent; (iv) to what extent evaluative distinctions may depend on *who* is doing the appraising (e.g. on variations in gender, ethnicity and political party affiliation) and on *what*, concretely, is being appraised; and (v) the degree to which these chosen ways of saying/meaning may be always already ideologically, and so attitudinally, *saturated* (White, list posting – AppraisalAnalysis@yahoogroups.com –

14/1/2005), and so 'primed', in Hoey-esque terms (2005), to appraise in certain ways.

20.1.2 Our methodology and the theory driving it

Our wider research does include the investigation of proper 'phraseologies': the tendency of words to "go together and make meanings by their combinations" (Sinclair, 1996:82), a phenomenon in which "meaning is attached to frequently-occurring sequences rather than to their constituent lexical or grammatical items" (Hunston, 2003:32). Certain phrases form a recognisable 'pattern' (Hunston and Francis, 2002) including both lexical and grammatical words, whereas others feature grammatical words found to have a strong mutual attraction. Biber (2009) distinguishes between what he calls multi-word collocations which are sequences of lexical words alone, and multi-word formulaic sequences which are sequences of lexical and grammatical words.

In this chapter, however, the phraseology we focus on is made up solely of a sequence of grammatical words – a fixed word-string which turned out to be frequently chosen in our corpus, whose non-obligatory subsequent co-text is probed for attitudinal features whose instantiation is hypothesised as having been called for by register-idiosyncratic choices in meaning. Procedurally, and in the wake of Hunston (2004), our study begins with a 'text': a randomly chosen one-minute speech, whose evaluative patterns, analysed with the APPRAISAL SYSTEMS model (Martin & White, 2005), serve as the basis for subsequent, comparative, corpus-assisted investigation – rather than corpus-based (again, see Teich, this volume) – using primarily Wordsmith Tools 5.0 (M. Scott, 2008) and Xaira (Burnard & Todd, s.a.). A basic knowledge of the model of APPRAISAL SYSTEMS, as developed within the systemic functional tradition, is presumed.

We admit to be practising 'CADS', an alluring acronym coined by Partington (2004) which stands, however, for what many scholars have been practising for some time now (e.g. Miller, 1999): corpus-assisted discourse studies – a methodological synergy of quantitative data and qualitative approaches.[2]

As Hunston (2004:169) rightly warns us, however, evaluation analysis is "by no means open to automation". It requires 'ticklish trawling' (Miller, 2000; see also Miller & Johnson, 2009); without it, motivated patterns of function bundles cannot be properly identified; with it, we manage to get a sense of

[2] CADS has been explicitly critiqued, however. See Baker *et al.* (2008:278): "In examining the combination of methods normally used by CDA and CL, we undertake to show that neither CDA nor CL need be subservient to the other (as the word 'assisted' in CADS implies), but that each contributes equally and distinctly to a methodological synergy". Partington (2008) – and we – would agree with the 'distinctly' but definitely put the accent on the 'armchair' rather than the 'machine'.

that "cumulative groove" of meaning patterning dynamically construed over stretches of texts (Coffin & O'Halloran, 2005:143), and so also evidence of evaluative propagation/ramification (Lemke, 1998:49–50). This also means paying attention to logogenesis – the dynamic build-up of meaning as texts unfold (Coffin & O'Halloran, 2006:81) – more attention than would be typical in corpus analysis.

Researching evaluative meaning with APPRAISAL SYSTEMS is in itself tricky business, as in-built interpretation fuzziness abounds. To reduce such indeterminacy one needs to (previously, but also endlessly) probe the contexts of both situation and culture of the corpus. Of course, all analysis is to some extent subjectively value-laden (Gouveia, 2003; Miller, 2000, 2007). To be able to classify instances of evaluation with any accuracy and determine if and how a text positions itself and its hearers/readers, we need to reduce as much as possible the imposition of our own value judgements on others' ways of saying and meaning. The assistance of computer technology helps to substantiate appraisal analysis greatly, by circumscribing the scope of the analyst's bias (Coffin & O'Halloran, 2005:144).

But researching APPRAISAL SYSTEMS also means investigating what Martin (2010:19) calls "the way in which meanings combine – across strata, metafunctions, ranks, and simultaneous systems", especially what he (2000:163–164) recognised as "couplings between ideational meaning and appraisal", what Martin and White (2005:62ff.) posit as a means of inviting/affording attitude. This interdependency between TRANSITIVITY and APPRAISAL SYSTEMS choices is probed in Miller (1999, 2002a), in an explicit attempt to answer Lemke's call for an "axiological discourse analysis that will trace the construction of value-orientations and orientations to other explicit and implicit discourse voices in a text . . . *however* expressed in the semantics of a text" (1990:446–447, her emphasis).

At the textual level then, our way of moving towards an interpretation of evaluative patterns in this register can be described as twofold: (i) probing the expanded instances of the sequences themselves, and (ii) providing as full an account as possible of all text passages (or, where too numerous, a substantively representative sample of the total proportions). Clearly posited is that corpora can usefully be used to 'shunt' (Halliday, 2002a; Miller, 2006b), from clause, or concordance line, to text, and also intertext, using the corpus as a kind of 'echo-chamber' (Thompson & Hunston, 2006a). In short, as said above, interpreting speaker choice occurs at different levels. Ultimately we aim at a 'social' interpretation of choice (cf. Halliday, 1978b), yet, as Halliday also points out (1994a:xvi), even what is typically the preliminary analytical step, at the level of grammar, "is already a work of interpretation". And it is a necessary, an essential, step.

In addition, as Matthiessen (1993:279) reminds us, "register analysis is inherently comparative". Although our aim is not only to compare these patterns

of wordings across registers, we look at frequencies in diverse corpora of similar and different registers to better interpret the incidence of features in our own. Select findings are thus tested against general corpora of English (British National Corpus; the spoken component of the Corpus of Contemporary American English), the House of Commons corpus compiled for the same period and topic, and various other smaller UK and US political corpora (see Section 20.2.2 for details).

Despite the fact that corpus-assisted methodology allows us to aim at register *synthesis* rather than too fine-grained register analysis (Matthiessen, 1993), our goals are vast and so the research, indisputably, is labour-intensive and time-consuming. However, we believe that the cumulative results of these painstaking studies can be said to add to the growing typology of resources for evaluation and intersubjective positioning in this register, and so also to contribute to the development of the cline of instantiation, with specific reference to 'key' and 'stance' (Martin & White, 2005:163–164). If findings also prove 'fuzzy' at times, so be it. As Halliday puts it: "Systemic grammatics is not uncomfortable with fuzziness. . . . it is an essential property that a grammatics *must* have if it is to have any value for intelligent computing" (2002d:417, our emphasis).

20.1.3 The Contextual Configuration

With reference to the 'Contextual Configuration' (CC; Hasan, 1978), i.e. "the totality of its detailed features – the specific values of Field, Tenor and Mode relevant to any particular instance of speaking" (Hasan, 1999:232), a general account of all the significant attributes of a given social activity which is receiving verbal expression in any given text or, we add, text collection, Miller (2004:275–276) describes the 'Field' of Congressional discourse, or the nature of the Congressional speech event, as institutionally legitimated alignment and/or alienation among elected Representatives. The overall subject matter being 'deliberately disputed' is the conflict in Iraq begun in 2003.

Regarding 'Tenor', speakers are peers with prestigious social status and have the discourse role of visibly taking their stance, arguing positions which *tend* to be in line with the party and/or the local electors they 'represent'.[3] However, the permeable distinction between the formal 'institutional tenor' of court decisions and their 'individual tenor' posited by Miller (2002b) is also a valid one for Congressional discourse. The addressees of interventions include other Representatives, the US public and media, and, on the subject of Iraq in 2003, were even more inclusive, also comprising the leaders and interest groups of foreign nations.

[3] Such party 'loyalty' is not of the same stringency as in the British parliamentary tradition.

Concerning the 'Mode' of discourse, the 'channel' was originally phonic, though, as discussed further below, we are working with written versions of at least pre-scripted speech events. The 'medium' of the message oscillates on a cline between the 'written-ness' and 'spoken-ness' extremes (Halliday, 1985).

The parameters are of course 'permeable' (Hasan, 1995:233, 2000:43), and so we also expect the grammar of the clause as exchange to be determined by the Field to a certain extent, as well as by accepted rhetorical practices, since "metafunctional choices construe not individual contextual factors . . . but aspects of contextual configurations" (Thompson, 1999:121). And regulating the socially recognisable features of the situation is of course the overarching system of US culture.

The register is deliberative, and argumentative, and its global rhetorical aim is composite: in Jakobson's (1960) minimal terms, referential primarily, but also emotive (at least apparently), conative, and even meta-lingual/-textual.

20.2 Research design: the corpus/corpora

We now give a brief overview of our corpus, presenting the comparable corpora used and the rationale for doing so.

20.2.1 The House of Representatives (HoR)

The HoR corpus is a collection of transcribed texts taken from the complete 2003 sessions of the US House of Representatives, part of the 108th Congress. The original source material is accessible from the official Congressional Record website[4] and was initially downloaded and stored in unmarked form, to create a 'raw' corpus of 17 million words or tokens.

From this material we created a homogeneous subcorpus – henceforth the HoR subcorpus, which formed part of the CorDis[5] project – on the topic of the Iraq war, by collecting speeches which contained occurrences of Iraq* (e.g. Iraq, Iraqi, etc.), and thus forming a fully representative subcorpus of Congressional discourse on this particular topic over the specific period of 2003. In addition, we posit that it is also 'notionally representative', i.e. capable of answering the questions put to it (Mauranen, 2001).

The organisation of the House of Representatives sessions typically involves self-contained one-minute speeches, as well as five-minute speeches, and sixty-minute speeches, delivered by the designees of the majority and minority

[4] Available at <http://thomas.loc.gov/>.

[5] Funded by the Italian Ministry of Education, University and Research (Protocol no. 2004105247), the aim of this project was to compile and analyse corpora of different text genres regarding the war in Iraq, in both English and Italian.

party leaders. There are also debates on resolutions or amendments. Where occurrences of Iraq* were found, the whole speech or debate was retained and included in the subcorpus. This means that some speeches, involving single speakers, may be described as monologues, while the debates were clearly dialogic in nature.

As regards the nature of the texts used in the corpus, are they to be considered as written or spoken text? The transcription in question may be described as a 'broad transcription', distinguishing "different speakers' utterances, dividing these into sentences or prosodic units, and dividing the latter into words, with a disambiguation of homophonous elements with distinct orthographical forms" (Aston & Burnard, 1997:26). Neither paralinguistic nor extralinguistic information is included; thus these transcriptions do not offer a 'true' representation of the event (Slembrouck, 1992). However, for our purposes this 'contaminated' text type may be considered sufficient (Miller, 1999:390–391), also because the speeches included in the Congressional Record are more appropriately described as 'previously prepared', rather than 'transcribed from spontaneous speech'. Nonetheless, these speeches were all classified as 'spoken' text in our corpus to distinguish them from 'written text' where the speakers explicitly mentioned specific written sources cited to support their argument.

The subcorpus thus compiled consisted of a total of 1,394,163 tokens.

20.2.1.1 Breakdown by party, sex and role

The 108th Congress consisted of 440 Representatives of the Republican, Democrat and Independent parties, including 377 men and 63 women; 229 were Republicans, 210 Democrats and only 1 Independent.[6] However, 15 per cent of these never spoke on the issue of Iraq and thus did not feature in the HoR corpus. The proportional contribution of men and women to the debate on Iraq corresponds to the ratio of males to females present in the House of Representatives subcorpus.

Figure 20.1[7] shows a breakdown expressed in the percentage of people talking about Iraq in the HoR subcorpus according to party/sex.

Of course not everyone said the same amount about the topic of Iraq. Figure 20.2 shows a breakdown expressed in the percentage of tokens according to party/sex in the HoR subcorpus.

Although there were more Republicans in the 2003 House, individual Democrats, both males and females, were slightly more loquacious on the subject of Iraq than their counterparts. However, division by sex in the subcorpus reflects the overall male/female ratio in the House of Representatives and is thus not significant. It might indeed be inferred that Iraq was an issue

[6] These utterances were disregarded for our study.

[7] Abbreviations throughout are: REP M – Republican males; REP F – Republican females; DEM M – Democrat males; DEM F – Democrat females.

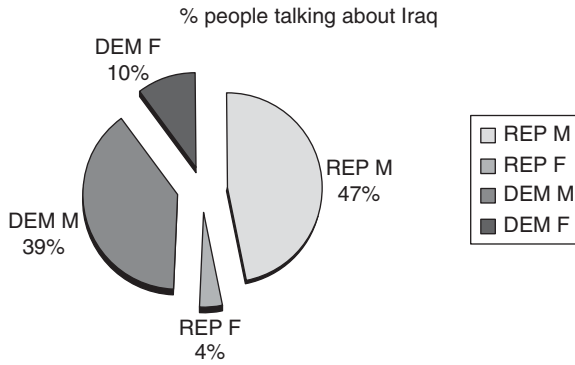

Figure 20.1. Percentage of people talking about Iraq according to party/sex in HoR

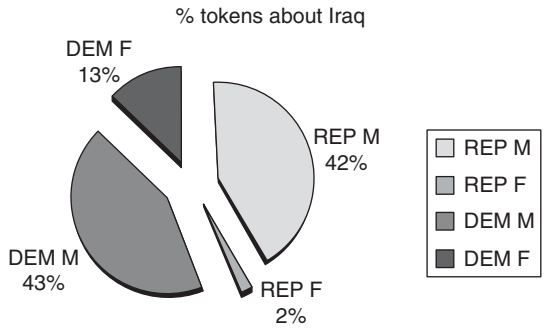

Figure 20.2. Percentage of tokens about Iraq according to party/sex in HoR

that both sexes felt equally strongly about, though on gender differences in speeches on this same topic in the House of Commons, see Bevitori (2007) and analysis below. To summarise, the Democrats as a whole say more about the war in Iraq. The Democrat males, though making up 38.5 per cent of the total speakers in the subcorpus, produce 43 per cent of the tokens. Democrat females (10 per cent of the total speakers) produce slightly more than would be expected too, with 13 per cent. Only the Republican women are significantly under-represented in the subcorpus, making up only 4 per cent of the total speakers and producing just 1.6 per cent of the tokens.

20.2.2 Comparative corpora

Our main benchmark for comparison as regards homogeneity of topic, time scale, period and text type was provided by the UK House of Commons

(henceforth HoC) corpus, which was also part of the CorDis project, consisting of 979,812 tokens. For further details of its compilation, see Bevitori (2007:143) and Bayley and Bevitori (2009:81–82).

Other corpora used for comparison in terms of numbers of occurrences included: the raw 2003 House of Representatives corpus (15,402,861 tokens; two corpora of written text, also part of the CorDis project (PapEd: editorials from both UK and US newspapers – total tokens 473,000, see Murphy, 2009:187 for details of compilation; PapNews: news reports from both UK and US newspapers – total tokens 529,531)); a collection of US Presidential speeches and televised debates dating between 1961 and 2008 (total tokens 780,151), with a subcorpus of the same; PD_A+D, consisting of presidential nomination acceptance speeches and debates alone), and a corpus of 1992–1999 parliamentary debates on the subject of European Union (EU: total tokens 661,835). Finally, the spoken sections of two general corpora – the Corpus of Contemporary American English (COCA) (Davies, 2008; about 85 million words at the time of our study), and the British National Corpus (BNC: about 10 million words) – were also compared.

It should be made clear that, with the exception of the HoC corpus, no quantification concerning evaluative mechanisms in the selected sequence has been carried out in these corpora, which have instead been used for comparison with HoR solely in terms of raw numbers of occurrences of the sequence examined. These numbers tell us something about register-idiosyncrasy, but hardly enough. And even the qualitative analysis offered below is exclusively in terms of HoR vs. HoC.

20.3 The study

As said above, the cornerstone of this research, following Hunston (2004), was a randomly chosen one-minute speech, the text of which follows:

Mr. KUCINICH. Mr. Speaker, **it is time for** the United States to get out of Iraq. But this administration, whose entry strategy was based on falsehood, with no exit strategy, has trapped our troops in Iraq and exposed them to greater harm. The total number of American casualties is now 232.

Here is what **needs to be done** diplomatically: the United Nations **must** be brought in. Negotiations for an exit **must** begin now. An exit agreement with the United Nations **must** involve the U.S. letting go of the contracting process; Halliburton, Brown and Root, et cetera. The U.S. **must** also take over the management, accounting, and distribution to the Iraqi people of the oil. Additionally, a transition from U.N. control to a self-determining governing structure by and for the Iraqi people **must** be planned. Finally, the administration, which unwisely ordered the bombing, **must** fund the reconstruction.

It was wrong to go into Iraq. It is wrong to stay in Iraq. U.S. out. U.N. in. **Let us** support our troops by bringing them home.

Table 20.1. Quantitative findings for variations on the phrase *we* > *must* in HoR (* = 1 other word, ** = 2 other words)

Party/sex	*We must*	*We * must*	*We ** must*	TOTAL ptw[a]
REP M	214	3	2	0.38
REP F	5	–	–	0.23
DEM M	276	5	3	0.47
DEM F	155	3	–	0.85
Total	650	11	5	0.48

[a] Party/sex ptw calculations are based on occurrences per thousand words of that sub-category's speech.

The phraseologies highlighted here in bold were subsequently investigated in the corpora. Space permits the discussion only of our findings with reference to the sequence *X must Y*. Besides numerical considerations, illustrated below, another rationale for opting to study the *we must* phrase is that we are most interested in the collective institutional participatory process typical of this register.

20.4 *we must*: from quantitative to qualitative findings

20.4.1 Quantitative findings in HoR

A Concord search was initially run with *must* as the search word, giving 1,566 hits (1.12 per thousand words (ptw)). An examination of left-hand – henceforth LH – collocates of *must* – who must? – showed (not surprisingly, given the nature of Congressional debate) that *we* was the most frequent first LH collocate, with 694 occurrences, thus figuring in almost half the phrases with *must* (44%) in HoR. Since *we* does not only directly precede the modal, but occurs in other LH positions in a 9-word window, as in the examples below, the total number of *we* as LH collocate (750 or 0.54 ptw) was considered to be significant (see Table 20.1):

id from the other side of the aisle here tonight, **we** absolutely **must** have them on our side. This is th

and

e and light is put out by one of these criminals, **we** as leaders **must** stand up and say, no more, you wi

The next most frequent subject pronoun as a LH collocate was *I*, with only 140 occurrences however (0.10 ptw).

Table 20.2. *Quantitative figures for* must *alone and in certain phrases across the corpora per thousand words*

Phrase	HoR	HoC	PD-A+D	PD-all	EU	PapEd	COCA sp	PapNews	BNC Sp
must	1.12	1.48	0.98	**2.20**	1.72	1.51	0.24	0.38	0.60
we must	0.54	0.56	0.38	**1.14**	0.60	0.09	0.03	0.04	0.05
I must	0.10	0.08	0.06	**0.05**	0.15	–	0.03	–	0.10

A breakdown of these figures per thousand words, according to party and sex, shows that Democrat women use *we must* almost twice as frequently (0.85 ptw) as their male counterparts (0.47 ptw). The male Republicans use the phrase only slightly less than their Democrat colleagues with 0.38 ptw, while Republican women use the phrase least (0.23 ptw).

Table 20.2 shows a quantitative comparison of frequency across the various corpora. The corpus in which each phrase is most frequent is given in **bold**. *must* occurs most frequently in the full US Presidential corpus, though it is also frequent across both UK and US parliamentary corpora in general and in newspaper editorials. Though *we must* is also most frequent in the full Presidential corpus, and just slightly less across the parliamentary corpora in general, the editorials clearly prefer other grammatical subjects to precede *must*. *we must* is much less typical of both the general spoken corpora and the written newspaper corpus. *I must* is most frequent in the EU corpus.

20.4.2 Comparative figures for must *in HoC*

For the sake of more effective comparison with the main focus of our chapter, the HoR corpus, in the breakdown of instances into party/sex we will only consider the figures for the Labour and Conservative parties, the two main parties at that time.

In HoC, 38 per cent of the total occurrences of *must* (1.48 ptw) were preceded by *we*. The phrase *we must* thus occurred 0.56 times ptw, almost identical therefore to its frequency in HoR. As in HoR, and in comparable proportions, the next most frequent subject pronoun in HoC was *I*, with the phrase *I must* being found 0.08 ptw. As regards breakdown into party/sex, as shown in Table 20.3,[8] Conservative males used the phrase *we must* slightly more frequently, with 0.7 times ptw, but unlike in HoR, there was no clear significant quantitative male/female distinction, though see qualitative findings below.

[8] Abbreviations throughout are: LAB M – Labour males; LAB F – Labour females; CON M – Conservative males; CON F – Conservative females.

Table 20.3. *Quantitative figures for* we > must *by party and sex in HoC*

Party/sex	*We must*	*We * must*	*We ** must*	TOTAL ptw[a]
LAB M	261	4	–	0.49
LAB F	43	–	–	0.59
CON M	170	1	1	0.69
CON F	5	–	–	0.34
Total	479	5	1	0.49

[a] Party/sex ptw calculations are based on occurrences per thousand words of that sub-category's speech.

20.4.3 Qualitative findings in HoR and HoC

Three initial caveats are in order: (i) although this subsection is categorised as 'qualitative', a fair amount of quantifying inevitably occurs below; (ii) we needed to cut the unwieldy number of instances in HoR to every 10th concordance (as in Stubbs, 2001). Results are thus less accurate, but, we maintain, still representative, as there is a comparable proportion of Democrat hits to Republican ones in both the full concordances of *we must* and in our cut version – and unless explicitly said, all figures refer to these cut versions; and (iii) we also expanded all concordances to an extent that allowed us to discern what was being said about what/whom and in what circumstances. In some cases growth was minimal; in others, intense 'choreographic' grammar meant it had to be sizeable.

All occurrences of *we must* instantiate high value subjective: implicit modulation and are mechanisms for making proposals, almost invariably *irrealis*. The exceptions are typically instantiated in numerous time-phase verbal group complexes: *we must continue* to do X, and conation complexes: *try* (2 occurrences), for a total of 23.9% of all Processes.

All instances also construe heteroglossic engagement, most in terms of Contraction: Proclamation: Pronouncement, except when with negative polarity, where they function to Disclaim: Deny and/or Counter.[9] Despite the question of dialogicity needing to be seen vis-à-vis the 'deliberate dispute' variety of text, negation in the environment of *we must* can still be said to figure strongly both in HoR and in HoC: between 10 and 11 per cent.

Interestingly, Subjectivisation – i.e. the choice for a subjective explicit metaphor of modality prefacing *we must* – is over five times more frequent

[9] Negativity has also emerged as a possibly register-idiosyncratic resource in this register (see Miller, 2007, and also Bevitori, 2007).

in HoR than in HoC. Full HoR concordances yield 25 occurrences of *I believe* (3.65% of all concordances) and 3 of *I think* (2 DEM M / 1 DEM F) vs., in HoC, a mere 4 instances of *I believe* (0.72%) and none of *I think*. Even more intriguingly, all but 3 instances in HoR are Democrat choices and nearly half of these are female Democrat choices, giving us another female Democrat thing then, perhaps linked to sociolinguistic findings concerning a gender-specific penchant for 'polite', or less aggressive, qualification in the language used by women.[10]

With reference to the ATTITUDE SYSTEM, the overwhelmingly predominant system construed – not only with *we must*, but by *all phraseologies investigated* in this research – is judgement,[11] which transitivity analysis reveals as being predominantly covert: i.e. invoked rather than inscribed. Indeed, certain typical if implicit ways of representing become with familiarity quasi-inscribed ways of appraising. Supporting our troops meaning passing the supplemental bill, meaning supporting the war, meaning being pro-Bush policies, etc., etc. Of the various co-textual conditioning mechanisms which are seen to 'position' readers/listeners towards associating tokens with particular attitudinal values – i.e. ideational content which is said to 'afford' attitude, intensifications which 'flag' it and lexical metaphor which 'provokes' it (Martin & White, 2005:61–68) – the chief means of invoking, and disambiguating, in both HoR and HoC is, by far, affording. Hence our focus below on the coupling of transitivity with *we must*.

Of the kinds of judgement instantiated, the main category is social sanction, and the sub-category, propriety (of doing what 'must(n't)' be done); another sub-category, veracity, is also noteworthy, predictably, given the substantial extant distrust concerning UN vs. US intelligence data on weapons of mass desctruction, etc. Regarding the co-textual environment of *we must* alone, 21.5 per cent of instances in HoR can be classified as judgement: social sanction: veracity, and a slightly higher 22.6 per cent in HoC. Thus the issue of truth-telling was a sizeable one on the issue on both sides of the Atlantic in 2003 (cf. Miller, 2004).

20.4.3.1 Who is included in 'we'?

As Leech and Svartvik (1975:144) say, "[w]ith a 1st person subject, *must* expresses the speaker's authority over himself (i.e., his sense of duty, social responsibility etc)", but, going *beyond modality*[12] – with a first person plural subject, speakers are also clearly attempting to *align* their hearers (their own

[10] Bevitori (2010) also noted this female Democrat tendency, but thinks that "the assertiveness of the deontic we must is strengthened by the modalized locution". Miller and Johnson (forthcoming) come back to this question.

[11] The finding is unsurprising; Miller (1999, 2002a, 2004a, 2004b, 2007) has found that judgement is THE system most construed in parliamentary debate.

[12] See White (2003). Though space precludes us doing so here, we also suggest that *we must* be considered in terms of the engagement sub-system of 'justification' that White illustrates there

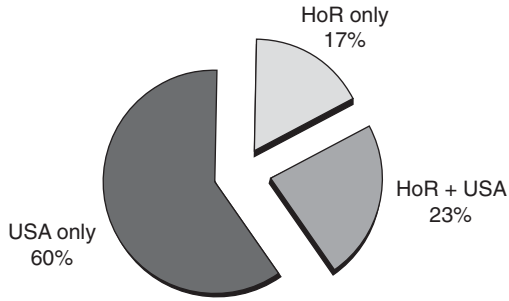

Figure 20.3. Who are *we* in HoR?

and/or other party and/or *all* Representatives/MPs) with their stance. But *who* is speaking in the sequence *we must*? That is, who, precisely, is 'we'?

For HoR, shown in Figure 20.3, the categories are just three and easily identifiable.[13] Interestingly, nearly 60 per cent are inclusive of US only, the next biggest category (23%) also includes the USA, while only 17 per cent seem to refer to HoR alone. In short, an overwhelming identity of speakers with the nation is construed.

Identifiable categories of 'we' more than double in HoC, signalling what might be seen as an identity crisis, unsurprisingly perhaps, considering the subject matter together with the fact that in 2003 Labour was in government and the Conservatives in opposition. It was also a thornier task to classify instances, thus percentages are somewhat less certain than for HoR.

Still, as shown in Figure 20.4, the largest of the seven identified HoC categories – with 32 per cent – comprises the UK + its allies and/or all of the Western world, but seems to *exclude* HoC itself, which, however, is included in the next two largest categories – HoC + UK, and the more extensive HoC + UK + allies + Western world, with 19 per cent each. 'We' as including HoC alone accounts for 17 per cent, exactly the same as for HoR alone, but 53 per cent of all instances in HoC show international inclusiveness, whereas in HoR none do. The global picture that emerges is of HoC members being not quite sure who they have the authority to speak with or for.

20.4.3.2 'Coupling' transitivity findings: What must 'we' do?

Process types were classified according to their grammatical reflexes, although, especially with causatives, some attention to less congruent wordings proved inevitable. The types and relative quantities are given in Figure 20.5.

and whose analytic potential should, we feel, be rehabilitated/revitalised, a goal that Swain (2010) is also working towards.

[13] Even when implicit, 'who' is unproblematically interpreted with reference to background knowledge of who has the institutional authority to do.

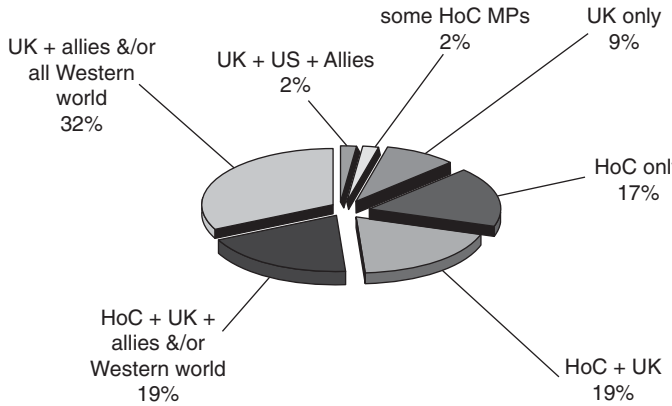

Figure 20.4. Who are *we* in HoC?

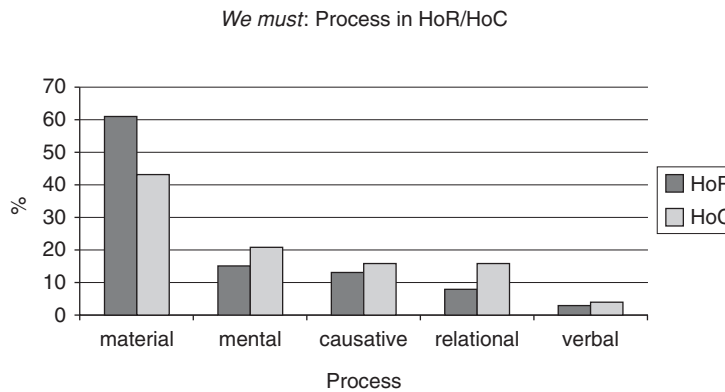

Figure 20.5. *we must*: process types in HoR vs. HoC

Of the 71 expanded concordance lines analysed in HoR, 75 Process types result – due to verbal group extension within clauses. In HoC the ratio is 56 types in 54 concordance lines. As Figure 20.5 shows, a concern with having to *do* (MATERIAL) is predominant in both corpora, particularly in HoR, whereas HoC is twice as involved as HoR with 'relating' (RELATIONAL), and somewhat more engaged with 'thinking' (MENTAL). In focusing on the demanded *doings*, we partitioned the deliberating bodies into party and sex.

Recalling that *we must* is a Democrat thing and particularly a female Democrat thing, what emerges from HoR concordances is a fair representation of traditional, pan-issue, party concerns, as can be seen in the illustrative examples in Table 20.4. Democrats (especially female Democrats) are more concerned

Table 20.4. *we must* do what?

We must	PARTY/SEX
continue to at least try to internationalize	DEM F
defend our values	DEM F
fund our homeland security needs	DEM F
invest in the teachers of Afghanistan	DEM F
not rush to do this	DEM F
protect and defend our cities at home	DEM F
reach out to others	DEM F
strive to protect our people at home	DEM F
calculate the cost of our homeland security	REP M
destroy them to advance our historic mission	REP M
finish what we started	REP M
increase vigilance at our back door	REP M
live up to our responsibilities	REP M
send our prayers and our hopes to these young	REP M

with [+humanistic] values: e.g. not rushing into war, reaching out to others, investing in teachers, trying to internationalise, etc., though also, much like Republicans, in protecting people at home, defending US values, and funding homeland security. Indeed, gender-role stereotypes emerge here, and not for the last time.[14]

Republican males are concerned with [+pragmatic], if rhetorically boosted, aspects: calculating the cost of our homeland security, increasing vigilance, destroying them to advance our historic mission, finishing what we started, but also with living up to our responsibilities and sending our prayers and our hopes to these youngsters (troops in Iraq).

In contrast, Labour males in HoC come across basically as pro-war, predictably echoing official Labour government policy but also the US male Republican way of saying above:

we must deal with the threat that Iraq poses [LAB M]

In HoC, noteworthy instances of the typically contracting (and almost certainly carefully planned/planted) rhetorical question occur:[15]

Does the Prime Minister agree that in Afghanistan, Iraq, or wherever else we have to fight the war on terror, *we must* finish the job we started or the terrorists will win in the end [LAB M]

[14] Again, Bevitori (2010) also found that the gender variable made the qualitative difference with *we must*.

[15] The phenomenon is due to the nature of Prime Minister's Question Time, where interventions are obligatorily interrogatives; these typically function to covertly construe highly evaluative presuppositions.

And gender typecast concerning protecting and caring are confirmed by female choices in the HoC corpus too:

we must do our utmost to prevent it [war] from happening [LAB F]

we must do better [to avoid collateral damage] [LAB F]

achieve a better outcome for the people of Iraq. *We must* continue to work on that. [LAB F]

The Conservatives split between antagonistic and pro-Labour-government positions, the former leading them into typical 'liberal' rhetoric:

we must not try to hide the truth. [CON M]

and the latter providing the comfort of a more traditional conservative stance:

we must see this through [i.e. continue to fight] [CON M]

20.4.3.3 What must 'we' think?

The mental Process is often the locus of a key typical argumentative strategy of this often 'persuasive' register: taken-for-grantedness. In terms of the engagement system, as Simon-Vandenbergen *et al*. (2007:47) argue, its value is quintessentially monoglossic:

> . . . there is another type of strategy which is at least as common as the bare statement to construe solidarity and to block dialogue. This is the presentation of material as presupposed. We want to argue that within the taxonomy of engagement modes it is the most dialogistically restrictive of all the engagement options, limiting the scope for dialogic alternatives even more thoroughly than bare assertions . . . the speaker does not simply decline to offer any recognition that the proposition is in some way problematic or subject to contestation (as is the case with non-presupposing bare assertions). They go beyond this to present the proposition as simply not at issue, as a proposition which can be assumed and hence need not be asserted.

This is a common strategic choice in HoR, where a full 16 per cent of Processes take a pre-packaged objectified metaphenomenon, or grammatical 'Fact' (Halliday & Matthiessen, 2004:470ff.), almost invariably in a *mental* Process environment. And the figure is analogous (15%) in HoC.

Semantically, the Fact regularly involves judgement: social sanction: veracity and appears to be a significant mechanism for construing a [+humanitarian] agenda. In HoR, the presupposition/Fact construction is more peculiar to the Democrat male.

we really must honor our veterans' service [DEM M]

We must honor our commitment to help the Iraqi people [DEM M]

So *we must never* forget the young people who are suffer [DEM M]

We must not lose their deeds to time or neglect [DEM M]

we must also discuss and recognize the racial disparity [DEM M]

The only Republican instance is far removed in topic and brief:

we must not forget that Turkey is a sovereign nation [REP M]

In HoC, Facts include, for Labour males: very serious problems / the threat Iraq poses / dangers others face / disorder and lawlessness – Things represented as requiring Hawk-like treatment. From the Conservative male we get: the avoidable nature of war / time to change policy / the consequences [of our reputation with] the EU / the sincerity of one another's views – which frankly ring more like the worries of 'wishy-washy bleeding-heart liberal Doves!' – revealing once more the political position-switching triggered by Labour's being in government and the Conservatives in opposition at this bellicose time. Indeed, only 58 per cent of voices highly sceptical of the government's pro-war facts and figures is Conservative, e.g.:

to keep the faith and trust of other countries, *we must not* try to hide the truth [CON M]

Whereas 42 per cent come from the government's own ranks, and, interestingly, the majority of these were not back- but frontbenchers, here failing to do what they otherwise naturally tend to do: toe the party line.

20.4.3.4 What must 'we' be?

We noted above that relational Processes follow *we must* twice as often in HoC as in HoR: 16 vs. 8 per cent. Focusing more closely on this pattern, Table 20.5 offers the breakdown of all Attributes chosen by speakers in HoR and HoC after 'be'. HoR uses 12 different epithets in more text, for a total of 4.2 per cent of *all* concordances. HoC uses 18 various wordings, in less text, for a total of 6 per cent.

HoC is thus more concerned with describing what *we must be*. As Table 20.5 also shows, it is also more metadiscursively concerned with being 'clear', a female Democrat priority in HoR and a male Labour and Liberal Democrat concern in HoC. Veracity is further brought into play with being 'honest': a Democrat priority in HoR (3 instances: 2 to male to 1 female), and a male Conservative concern in HoC, appearing, however, only once. Being 'fair' is a Democrat female thing exclusively, while being 'careful' is exclusively a HoC male thing, cutting across party lines, and largely relating to the wisdom of following the US lead.

Prepared-ness is a shared concern on both sides of the Atlantic, though more so in HoR: for most speakers, basically to use force, but also for various other eventualities, including to stand up, and speak out, and to advance the cause of peace in HoR, where Democrats simultaneously construe judgement

Table 20.5. *we must* be what? HoR vs. HoC

Judgement	All HoR: 30 occurrences – 4.2%	All HoC: 33 occurrences – 6%
Tenacity	*confident* (1) DEM M *willing* (3) all REP M *prepared* (9) 6 DEM M 3 REP M	*resolute* (1) CON M *invincingly committed* (1) LAB F *assured* (1) CON M *willing* (1) LAB F *sure* (1) LAB M *ready* (1) CON M *prepared* (6) 3 LAB M, 3 CON M
Veracity	*clear* (2) DEM F *honest* (3) 1 DEM, 2 DEM *open* (2) DEM M *realistic* (3) 2 DEM F, 1 DEM M	*honest* (1) CON M *clear* (7) 5 LAB M, 2 LIB DEM M *absolutely clear* (1) CON M *a lot clearer* (1) LIB DEM M *realistic* (1) LIB DEM M
Propriety	*vigilant* (1) DEM M *mindful* (3) 2 DEM F, 1 (*ever*) DEM M *fair* (1) DEM F *wise* (1) DEM M	*wary* (2) LAB M, CON M *modern* (1) CON M *thankful* (1) CON M *cautious* (1) CON M *careful* (2) LAB M, LIB DEM M *very careful* (3) LAB M, CON M, Ulster Unionist M

on veracity: on being 'honest' about what the war means and 'mindful' of the significance of Congress behaving candidly. Willingness is solely male Republican, concerning acting, paying the price and making the sacrifices being tough on Saddam entails.

As Table 20.5 also shows, we marshalled the choices according to the judgement category they provoked, and Figures 20.6 and 20.7 show a proportional representation of this. As hypothesised, the same three categories emerge as being construed in both HoR and HoC, and with the same order of prominence: (i) tenacity, (ii) veracity and (iii) propriety. In HoR, however, the deviation among the categories is greater than in HoC, indeed more than 10 per cent between them, while percentages in HoC are more comparable.[16]

20.4.3.5 What must 'we' make happen?

Causation analysis further supports what have emerged as typical targets of speakers' anxieties: 10 of 12 instances are Democrat, focusing on enhancing/ensuring human rights, living up to responsibilities, reliability, but also US

[16] Many veracity choices might be seen to function as propriety as well, but such double-coding has not been performed here.

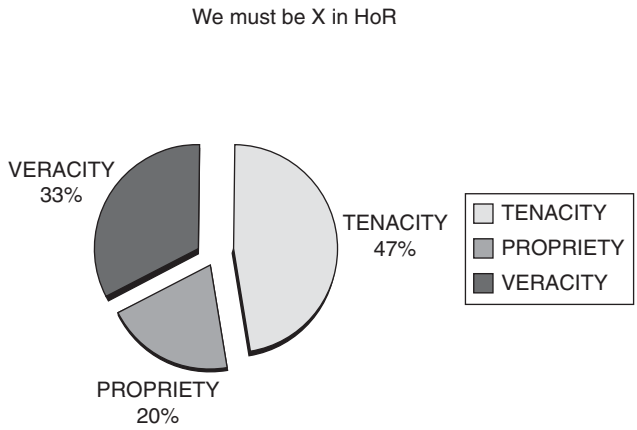

Figure 20.6. *we must* be X: from Attribute to Attitude in HoR

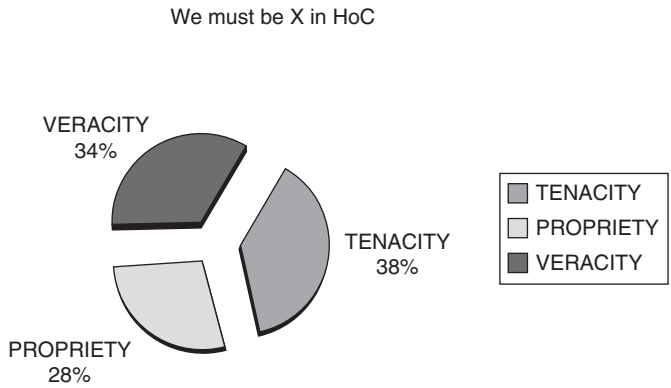

Figure 20.7. *we must* be X: from Attribute to Attitude in HoC

needs; Republicans would ensure vigilance, but also peace and prosperity for Iraq.

In HoC, there are no instances of causation instantiated by Conservatives: pure coincidence? Perhaps. But it may also be a(n interpersonal) question of their not being the party responsible for proposing to put Saddam out of operation. Male Labour MPs want to make institutions operate, terrorists fail, the UN to still play a role, processes to move forward, Saddam to move quickly, and more international co-operation in fighting threats. One female Labour MP again provides evidence of a possibly gender-conditioned discursive role, 'mothering' in this case:

We must win the campaign and not allow our armed forces to go into conflict without the correct weaponry to protect them.

There would, of course, be much more to say: e.g. the role of grammatical parallelism in attitude-flagging has not been adequately illustrated, and the role of negation, suggested in past studies as a register-idiosyncratic mechanism, has merely been broached. But the space for saying is circumscribed.

So then, to conclude.

20.5 Parting thoughts

This chapter has addressed the question of the possibly 'register-idiosyncratic' nature of evaluative speaker choice in Congressional debate by probing the extent to which a single grammatical pattern may be regarded as semantically significant with reference to this one given functional variety of text. The central theoretical-methodological concepts involved were discussed and select quantitative and qualitative results of our corpus-assisted comparative study of the sequence and its non-obligatory, probabilistic, right-hand co-textual instantiations were reported.

Have the (at times fuzzy!) results demonstrated the register-idiosyncrasy of the recurring patterns of meaning investigated (including those not reported here!), as they were meant to do? On the whole, yes. The relative frequency of this evaluative grammatical pattern in Congressional/parliamentary debate is significantly higher than in other text types, but parallel gender and political party predilections for certain ways of saying also emerge. In Miller and Johnson (2009) we had given the lie to Lakoff's (2002) too-facile distinction between a 'strict father' mentality of Conservatives – our Republicans – and a 'nurturant parent' mentality of the Liberals – our Democrats. This study has shown in particular how these divisions are further complicated by the criterion of sex. Appraisal analysis shows a high degree of salience, and cultural 'saturation', of semantically prosodic/propagated patterns. It also confirms a finding consistently emerging in previous studies, i.e. that the register is largely about judging the propriety – and veracity – of behaviour. What is more, it further corroborates our past verdict: that evaluative patternings are typically multiple, densely intertwined – 'coupled' – and interdependent.

But the study has also revealed that non-permanent contextual considerations, such as: (i) the subject matter of our 2003 corpus – the war on terror in Iraq – and (ii) the identity of the parties in government and opposition at that time, also shaped choices. Evidence includes what appears to be an excessive amplification of the permanently competing US discourses of self-interest vs. the common good in HoR (Miller & Johnson, 2009), and an atypical appraise*r* identity crisis vis-à-vis the meaning of 'we' in HoC. Accordingly, additional

investigation is needed to be able to assert the register-idiosyncracy of these speaker choices with unwavering – and unassailable – conviction.

Institutional and individual speaker positioning with reference to these competing discourses and the war in Iraq can also, we suggest, be usefully correlated to Weber's (1921) distinction between an ethics of responsibility, dictating accountability for one's actions in terms of their concrete outcomes, and an ethics of ultimate ends, according to which absolutes, and not consequences, constitute the basis of action. Such conflicting ideologies might also be illuminated with reference to systems of coding orientations (Martin, 1992), or 'individuation', which "[i]n Bernstein's terms . . . has to do with the relationship between the reservoir of meanings in a culture and the repertoire a given individual can mobilize" (Martin, 2010:23). In Miller and Johnson (forthcoming), we investigate a formulaic phraseology in this same corpus with these two distinctions clearly and visibly to the fore.

21 Not exactly black letter law: emergent choices and textual symbolic design in Athenian legal–political oratory

Astika Kappagoda

21.1 Introduction

This chapter examines the extent to which the notion of linguistic choice provides an explanation of some of the design of an oratorical text in ancient Greek, and what it might say for the notion of 'choosing what to say'. Oratory in ancient Greece was regarded as a highly crafted and highly purposed form of talk, in a culture that already valued literature, drama, history, science and art, and where argumentation and persuasion were the foundation on which public life was built. Does linguistic choice mediate this variety of talk? It is argued that choice, as conceptualised in Systemic Functional Linguistics (SFL), does have a role in explaining these linguistic patterns. But one must carefully consider the theoretical question of what 'choice' means in SFL. I argue that the concept of choice will ultimately turn out to be not an explanatory endpoint, but a gateway to understanding the operation of the probability-based complex adaptive systems of language and text. The emergent character of linguistic motifs in the speech analysed in this chapter supports the notion of these conditioned linguistic probabilities in action.

The political orator Demosthenes' speech *On The Crown* (Greek title *peri tou stephanou*; Latinised to *De Corona*; cited in this chapter as Demosthenes 18, using the text of the speech as found in Dilts, 2002) is one of the most widely admired pieces of Greek oratory from the fourth century BCE. *On The Crown* embodies a subtle and intricate negotiation by Demosthenes through a complex legal and political landscape. To this end, Demosthenes constructs a text whose semantic design is appropriate to the context in which he delivers the speech – both the context of situation and context of culture of speechmaking and political discourse in classical period Athens.

Here, it is argued that textual design is symbolic design that is adaptive to the semiotic and social context of fourth-century BCE Athens, and that this is the result of (i) the accumulation of selections within a given linguistic system, and (ii) the relations that hold between sets of selections in relatively discrete linguistic systems, resulting in emergent linguistic co-patterning. If thought

of this way, then the design of a text with respect to its social and semiotic context is only indirectly the result of selections in linguistic systems, and even then linguistic choice is as conceived of in the systemic functional framework, which does not necessarily correspond to the notion of individual psychological intention.

To demonstrate this, this discussion focuses on the accumulation of choices in two lexicogrammatical systems in ancient Greek – the system of THEME, and the systems of TAXIS and LOGICO-SEMANTIC RELATIONS as applied to the analysis of an important section of Demosthenes' speech.

21.2 Law and politics: the context of the speech

21.2.1 The context of situation: personal, legal and political attack in Athens in response to Philip II of Macedonia (Yunis, 2001:1–17)

The Macedonian King Philip II (the father of Alexander the Great) became the dominant military and political player in the Greek world during the fourth century BCE. As part of this process, Philip gained control of the Greek mainland, including Athens, through the battle of Chaironeia in 338 BCE. This occurred after a number of military, diplomatic and political events between Athens and Macedonia, and within Athens itself.

Diplomatic events before Chaironeia brought two prominent men in Athens into political conflict with each other – Demosthenes and the politician Aeschines. They were bitter political rivals, espousing opposing strategies (war and negotiation, respectively) for dealing with Philip. Over the course of several years, claim and counter-claim were traded between the two, each accusing the other of colluding with Philip and of selling out Athens' interests.

In 336 BCE, a certain Ctesiphon proposed that the Athenian assembly award a golden crown (Greek *stephanos*) to Demosthenes to recognise his public work, and for his support of the best interests of the assembly and Athens. Aeschines sensed an opportunity to restore his own standing and to demolish that of Demosthenes. He lodged a *graphê paranomon*, a charge that the award (ratified by Athens' *boulê* [council]) contravened statute law (Johnstone, 1999:37–40; Yunis, 1988:368–369). In spite of its technical legal meaning, such a charge in practice gave political rivals opportunity to attack each other in the courts (Yunis, 2001:8–9; Todd, 1993:154–163). Although Ctesiphon was technically the defendant, Demosthenes stepped in to answer the *graphê paranomon* charge himself.

The context of situation for this speech, therefore, is quite complex. It is simultaneously a defence of oneself in court, a narrative and justification of one's public life, and an opportunity to attack and discredit enemies. As a result, Demosthenes does not ultimately aim to persuade the jury that he is technically not guilty (Yunis, 1988:375); instead, the speech is focused on why he deserves

the award, and why his political conduct has always been in Athens' interests. Demosthenes therefore answers a legal charge with a political argument. Part of this defence of his conduct (Demosthenes 18:42–49) is to emphasise that he discerned Philip's real intentions against Athens when others, wilfully or unwittingly, did not. It is with this particular section of the speech that the following discussion is concerned.

21.2.2 The context of culture: oratory as the literature of political thought

Persuasive oratory became established in the Greek world in two ways: through the operation of public life, and through literature. The notions of argument, rhetoric and persuasion, and an awareness that these arose by conscious and deliberate use of the ancient Greek language, were well established before the fifth century BCE, not least through activities of legal and political disputation.

Two factors in the legal system made the appreciation and use of effective argumentation particularly valued. First, the court was expected to be the domain of those who were relative novices at legal process, although with professional help behind the scenes (Todd, 1993:77–97). Moreover, in Greek legal systems, compared with the present day, there was fluidity in choosing legal procedure, and in the status of written and verbal evidence (Thür, 2005; Todd, 1990:23–30, 1993:96–97; Johnstone, 1999:83–92). As a result, legal cases were assessed by the quality of their arguments taken by themselves, and less by their citing of factual evidence. Consequently, a wide range of effective oratorical skills was a highly prized asset. Therefore, a consciousness of text design and the available linguistic resources became essential to legal and political argumentation.

These strands of cultural literary practice come together in Demosthenes' speeches as we have them. Thus an audience or reader can expect *On The Crown* to fulfil literary expectations, to act as a model for effective public speaking and persuasion, and to be an embodiment of political thinking, action and reflection. These are strong contextual parameters which allow for the emergence and persistence of particular linguistic patterning.

21.3 Thematic analysis

The first assumption made in this discussion is that any text has a particular 'method of development'. This term, originally coined by the Prague School, later adopted into SFL and further developed (Mathesius, 1937; Daneš, 1974; Fries, 1995; Hasan & Fries, 1995), refers to the fact that a text develops information from a given starting point, and that each clause also has a point of departure which underlies the overall flow of information in a text. Importantly for this discussion, in the 'unmarked' case the point of departure of a clause,

Table 21.1. *Theme and Rheme*

Demosthenes 18.43.2.2	‖ *oude phônên*	*êkouon* ‖
	Theme	**Rheme**
	nor their voice	did they listen
	‘nor did they listen to anyone’s voice’	

and of a text, usually consists of information already known to, or assumed by, the speaker and audience. However, if this information is actually new to the text (the marked case), then such information is symbolised in the text as if it were assumed or previously given information. Speakers can often exploit this phenomenon for their own ends, and from time to time ‘slip in’ information which is actually new, but has the effect of the audience assuming it is part of their shared contextual knowledge.

21.3.1 The THEME system

When we turn our attention to the individual clauses of a text, the departure point (or ‘focus’, or ‘starting point’) of each clause – what the clause is about – is under the control of the grammatical resources of a language, and is referred to as the Theme of a clause (Halliday & Matthiessen, 2004:64–67). A clause constituent is selected in the lexicogrammatical system to take on this Theme role. Modern linguistic studies that ultimately draw upon the Prague School imply a concept of Theme by assuming that word order is motivated by the context of the speaker and text. This has been implicit in many studies of word order in classical language linguistics (Weil, 1887; Denniston, 1954:41–59; Dik, 1994, 1995; Horrocks, 1997:59–60; see also Hasan & Fries, 1995).

21.3.2 The practical determination of the Theme of the ancient Greek clause

In SFL studies of English, the prominent element of a clause falls on the experiential element that occurs first in the clause, labelled the Theme (following Halliday & Matthiessen, 2004; Graber, 2001:135–141). For practical purposes, the other ‘non-first’ elements of the clause are collectively called the Rheme. An example from *On The Crown* is shown in Table 21.1.

[Note that the clause numbering consists of three numbers separated by periods following the standard reference to the speech (Demosthenes 18): the first refers to the section number, following the section number notation convention in Dilts (2002); the second, to the clause complex (or ‘sentence’) number in the section as determined by the linguistic analysis; the third, to

the clause number in the clause complex concerned. The clause boundaries are marked with a double vertical line ‖.]

The Theme of the ancient Greek clause is likely to be assigned to initial position for a number of reasons. First, as in English, the topical element of the clause is not morphologically marked, which makes it more likely that Theme is expressed through clause position. Second, the elements of the clause that relate the clause to other clauses in the text and the text and context as a whole – particles and conjunctions – are obvious candidates as clause elements that 'start off' the clause. These typically gravitate to the initial parts of the clause, which makes it likely that any word group that most closely associates with these elements is likely to be the most 'thematic' group of the clause. It is for these reasons that it is provisionally assumed that initial position has the role of Theme assigned to it. However, the most convincing test is if one is able to relate these most initial groups to the co-text and context in which the clauses are located, since Theme, in SFL theory, typically is a 'microcosm' of the concerns and development of the text as a whole (Hasan & Fries, 1995:xxvii; Fries, 1995:323–325; Halliday & Matthiessen, 2004:100–105).

We can test this idea out on Demosthenes' text by identifying the initial clausal constituent of each clause of a representative stretch of text from *On The Crown*:

Demosthenes 18.173

ephanên toinun houtos en ekeinêi têi hêmerâi egô ‖ *kai parelthôn* ‖ *eipon eis humas,* ‖ *ha mou duoin heinek' akousate* ‖ *proskhontes ton noun,* ||| *henos men,* ‖ *hin' eidêth'* ‖ *hoti monos tôn [[legontôn* ‖ *kai politeuomenôn]] egô tên tês eunoias taxin en tois deinois ouk elipon,* ‖ *alla kai legôn* ‖ *kai graphôn* ‖ *exêtasdomên [[ta deonth']] huper humôn en autois tois phoberois,* ||| *heterou de, hoti << mikron analôsantes khronon >> pollôi pros ta loipa tês pasês politeias esesth' empeiroteroi.* |||

Translation

'This person – me – did present myself on that day, ‖ and I got up ‖ and said to you ‖ things which you should listen to, for two reasons ‖ and pay attention to – ||| firstly, so that you may know ‖ that I alone, of those [[who made speeches ‖ and were politicians]], did not abandon my post of patriotism during difficult times, ‖ but also, by making speeches ‖ and writing arguments, ‖ I proved myself on your behalf for [[what was required]] in these fearful times – ||| and secondly, << expending a small amount of time, >> that you would be more greatly experienced in all your political life in the future. |||'

The highlighted initial clause constituents of the ranking (non-embedded) clauses in this section of the speech show that Demosthenes uses initial clause constituent position to fulfil three functions in the text of the section. The first of these is to bring to prominence the actions of himself (*ephanên* ['I appeared'],

parelthôn [‘I came up’], *eipon* [‘I said’], *legôn* [‘speaking’], *graphôn* [‘writing’], *exêtasdomên* [‘I proved myself’]) and the putative actions of his audience (*proskhontes* [‘paying attention’], *eidêth’* [‘you know’]) through putting verbs (both finite and non-finite) in initial position of their respective clauses. The rich morphological inflectional system of Greek for nouns, verbs and adjectives provides the potential for clauses to be ‘verb initial’. In the case of finite verbs the suffixal inflection denotes the ‘person’ (first, second, third), which allows the Subject of the clause to be retrieved from the rest of the clause or inferred from the context of situation. The second function of Theme in this section is to organise text segments into a defined argument structure (*ha* [‘those things’], *henos* [‘one thing’], *heterou* [‘the other thing’]), where Demosthenes refers first to what he has said to his audience, and then enumerates the particular points he wants to make. Third, Theme is used to make semantic contrasts between different words in separate clauses (*micron* [‘small’] *pollôi* [‘by much’]) – the well-known stylistic technique of antithesis found in many ancient Greek texts. In this way, Demosthenes uses the grammatical resource of Theme to highlight the actions of himself and his audience, to manage the argument structure of his text, and to create particular stylistic effects. These consistencies of selection of a functional element comprising information from co-text and context, mapped onto the single initial clause constituent, reflect the functions of Theme. Given the above analysis, it is likely that Theme typically takes a clause-initial position. A detailed quantitative analysis of a large volume of text to prove this is beyond the scope of this chapter. Additionally, the lack of an available spoken form of Greek makes evidence from tone groups not possible.

The clause constituents highlighted in this section each represent some element of the state of affairs construed by each clause, and so can be labelled Topical Theme. The analysis of Topical Themes will be the focus of analysis and interpretation here. It should be noted that various other elements, identified in SFL, may be associated with this clause-initial position, and have a function in either semantically relating one clause to another (such as particles and conjunctions) or expressing speaker evaluations of the clause content (such as modal adjuncts). Analysis of these elements (Textual and Interpersonal Theme) will be left aside from further discussion, as will a full justification for the boundaries and extent of Theme in a clause.

An ancient Greek speaker, theoretically, can select any experiential element in a clause as Topical Theme, because of the free word order that is found in Greek, although to call this ‘free word order’ would be to overstate the case (Luraghi, 2005:73–75). Nevertheless, there is no absolute requirement that the grammatical subject of the clause precedes other clause elements. Therefore, an individual speaker has some freedom to assign Topical Theme to a non-Subject element of the clause. But at the same time, one might expect such choices to be constrained by, and be appropriate to, the co-text and context. The choice

of Topical Theme is therefore under the influence of the requirements of the discourse and the context – a point borne out by the analysis in this discussion.

21.3.3 Interpreting Topical Theme as a resource for constructing rhetoric

Topical Theme allows the author of a text to highlight particular aspects of the situation about which they are talking, and develop their representation from this point of departure. We thus expect that how the author wants the audience to see a particular situation – and in particular in what terms or what frame of reference – is reflected in that author's selections of Topical Theme (Fries, 1995:325).

We expect that a Theme analysis of the clauses of the text would provide a significant insight into important aspects of rhetoric – including the more modern notions of examining the 'design' and structure of text varieties associated with a wide variety of social purposes (Toolan, 2001:206–241). In this case, the analysis of Theme reflects the particular perspective that Demosthenes has on Athens' geopolitical situation, and that the points Demosthenes makes develop out of this perspective.

21.3.4 Topical Theme reflecting the perspective adopted in the speech

The Topical Themes in this passage focus the clauses on the 'main players' in the Greek and Macedonian worlds that are involved in the confrontation between the Greek states and Philip. This can be illustrated in the examples in Table 21.2. The Topical Themes in each of the clauses have been underlined in the glosses and translations.

[Note that in addition to the explanation of the examples cited in previous sections, in the following analysis of individual clauses, there is a gloss provided of each constituent of the clause, followed by the author's idiomatic translation of the clause which aims to reflect the structure of the Greek grammar as much as possible.]

In this way, the selection of Topical Theme in these clauses is intended to gear the audience towards seeing the conflict as being between a number of sides. This includes 'you' – the jury hearing the speech, and more generally the Athenian people and government by extension. In each of these clauses, the Topical Theme containing each 'major player' in the action serves as the 'anchor point' from which the events are described and unfolded.

It may be argued that the reason why these players in the courtroom and the political scene are selected as Topical Theme is essentially a product of the high likelihood that the Subject will occur in initial position in the clause. However, the presence of Subject in the Topical Theme is motivated not only by the usual, 'unmarked' operation of the grammatical system, but also, importantly,

Table 21.2. *Selections of Topical Theme*

Demosthenes 18.43.1.1	*hoi < men > kataptustoi Thettaloi kai anaisthêtoi Thêbaioi*		*philon, euergetên, sôtêra*	*ton Philippon_*	*hêgounto.* ‖‖
	Topical Theme_ (<Textual Theme>)		**Rheme**		
	The detestable Thessalians and unaware Thebans		friend, benefactor, saviour	Philip	they were believing
‘the detestable Thessalians and the non-cognisant Thebans believed in Philip as their friend, benefactor and saviour’					
Demosthenes 18.43.3.3	*humeis*	*d’*	*êgete*	*tên eirênên*	*homôs;* ‖‖
	Topical Theme	**Textual Theme**	**Rheme**		
	you		you were conducting	the truce	nevertheless
‘but you (Athenians) abided by the truce nevertheless’					
Demosthenes 18.44.1.2	*Philippos*		*Illurious kai Triballous, tinas de kai tôn Hellênôn*		*katestrepheto,*‖
	Theme		**Rheme**		
	Philip		Illyrians and Triballi and some others of the Greeks		he was subduing
‘Philip subdued the Illyrians, the Triballi and others of the Greeks’					

by the discourse requirements. In this case, the discourse motivation is the need to anchor the happenings represented in each clause with respect to people, and groups of people, deemed important for the particular argument that Demosthenes puts forward.

21.3.5 Aligning the political and the legal through selections in the THEME system

Part of the reason for Demosthenes highlighting the action as being mediated between sides is that the legal process is also between ‘sides’ – Demosthenes on one side, Aeschines on the other, each the ‘leader’ of their respective political fellow travellers, addressing a third party, the jury (*andres Athênaioi*). And indeed, each of them turns up as Topical Theme (see Table 21.3).

Table 21.3. *Major players in discourse selected as Theme*

Demosthenes 18.43.3.3	*humeis*	*d'*	*êgete*	*tên eirênên*	*homôs;* |||
	Topical Theme	**Textual Theme**	**Rheme**		
	You		were conducting	the peace	nevertheless
	'but you observed the truce nevertheless'				

Demosthenes 18.45.1.1	*egô*	*men gar*	*proulegon* ‖
	Topical Theme	**Textual Theme**	**Rheme**
	I	Because	was foretelling
	'for I warned you . . . '		

Demosthenes 18.128.1.1	*soi*	*d'*	*aretês*	*ô katharma*	*ê tois sois*	*tis metousia;* ‖
	Topical Theme	**Textual Theme**	**Rheme**			
	for you	PART	of virtue	o outcast	or for your family	what share
	'What do you or your family have to do with virtue, you outcast?'					

In this way, by allowing the participants in the legal process to be the topic of their respective clauses, just as the main political participants in Greece are in their clauses, Demosthenes portrays the legal events as intimately connected with the political ones with which the court case is concerned. Thus the selections of Theme have an important role in construing the experienced world (the political situation) in terms of a particular cultural activity (arguing one's case in court). The court case is being presented not just as another case, but one that has ramifications for the Athenian polity as a whole.

The other important point to note is that these selections of Theme are an important strategy in persuading the audience that the political situation in Greece, and the events that brought it about, have direct relevance to the legal case being played out, and to Demosthenes' own conduct. This is particularly important with respect to the *graphê paranomon*. Demosthenes wants his political conduct to be *non-legalistically* judged by the people of Athens. By selecting both the legal combatants in the courtroom and the political players

of the Greek mainland as Themes, Demosthenes makes the political manoeuvrings outside the courtroom seem to be relevant to the legal argument, and thus makes the defence of his personal conduct in court directly relevant to wider issues that affect the whole of Athens. This in turn subserves a larger overall strategy to portray himself as being fundamentally connected and important to Athens' welfare. This patterning of Themes in the speech thus are an important means by which the functions of speeches defending against a *graphê paranomon* are mediated, and are a means of developing Demosthenes' own aims and strategies. In this way, one might say that this particular use of the system of THEME in Greek underpins an important aspect of the genre of the *graphê paranomon* which Demosthenes exploits.

By these means, Demosthenes creates a situation where political arguments are seen to be on the same footing as legal ones. Demosthenes allows his political arguments to 'piggyback' on a legal framework, in order to demonstrate that his political conduct is also properly reviewed and approved by the Athenian polity. The patterns of Topical Theme noted above, by closely linking the political world to the legal context of the court, play an important role in allowing Demosthenes to exploit the opportunities provided by a *graphê paranomon* case to further his own standing, and effectively to answer a legal argument with a political one. This linguistic co-patterning may potentially be the result of choice, but later it will be argued that this is the result of the probabilistic nature of linguistic phenomena.

21.4 The interpretation of clause complexing

21.4.1 Taxis: relationships of co-ordination and subordination between clauses

In SFL, two dimensions of clause complexing are identified. The first of these is the system of TAXIS (Halliday & Matthiessen, 2004:373–376). In this system, clauses may be seen as able to stand independently (paratactic), and these tactic relationships are denoted in an analysis by numbers (1, 2, 3 . . .). Alternatively, one clause is 'dependent' on another clause (hypotactic). These hypotactic relationships are usually denoted by letters (a, b) where the subordinated clause (b) depends on another clause (a).

In English, and indeed as in Greek, there is no theoretical limit as to the number of clauses that can be paratactically or hypotactically arranged in a single complex sentence; indeed, as we shall see in Demosthenes (and this holds true of many other Greek authors), the number and complexity of these complexes of clauses can be quite considerable (see Table 21.4).

[Note that in the annotation of clause complexes, clauses are numbered as in previous examples and tables, followed by their taxis labels (following Halliday

Table 21.4. *Example of complex sentence involving both paratactic and hypotactic complexing of clauses*

Demosthenes 18		
47.2.1	1 b	*oudeis gar, andres Athênaioi, [[to [[tou prodidontos]] sumpheron]] sdêtôn* ‖ For no-one, men of Athens, because he seeks [[what benefits [[the betrayer]]]] ‖
47.2.2	1 a	*khrêmat' analiskei,* ‖ spends his money, ‖
47.2.3	+2 a	*oud' << >> tôi prodotêi sumboulôi peri tôn loipôn eti khrêtai;* ||| nor << >> does he any longer make use of the traitor's counsel for matters in the future; |||
47.2.4	+2 b	<< *epeidan [[hôn an priêtai]] kurios genêtai* >> << when he has become master [[of what he has bought]] >>
oudeis gar, andres Athênaioi, to tou prodidontos sumpheron sdêtôn khrêmat' analiskei, oud' epeidan ôn an priêtai kurios genêtai tôi prodotêi sumboulôi peri tôn loipôn eti khrêtai; 'For no-one, men of Athens, spends his money because he seeks to benefit the person who betrays him, nor, when he gets control of what he has bought, does he make further use of his betrayer's counsel for other remaining matters;'		

Key for clause complex annotation

1,2,3 . . .	Paratactic labels
A,b	Hypotactic labels
<< >>	Boundaries of one clause interrupting another
[[]]	Boundaries of one clause embedded inside another
‖	Boundary between clauses at the same 'level'
|||	Boundary between clause complexes

& Matthiessen, 2004:388–395), followed by the whole clause and its gloss. The whole clause complex is then presented, with an idiomatic translation of the whole complex.]

21.4.2 Logico-semantic relations: encoded meaning relationships between clauses

Operating concurrently with the system of TAXIS is the system of LOGICO-SEMANTIC RELATIONS (Halliday & Matthiessen, 2004:373, 395–482). These relationships are usually marked 'structurally' in the grammar of individual clauses in the complex, such as through the use of particles and conjunctions, and the use of non-finite verbal forms (such as participles and infinitives) in hypotactic clauses that stand in relation to the finite verbs of 'main' clauses. These logico-semantic relations in the grammar of Greek are of a number of well-defined types that have been well documented in traditional grammars, such as time, cause, concession, the grammar of indirect speech, thought and perception, relative clauses, and other clauses that are linked through 'additive' or 'subtractive' conjunctions such as 'and', 'or' and 'but'.

Armed with these concepts, the reader of a Greek text will be able to observe that there is considerable variation in the kind of complexity of taxis and logico-semantic relations as a text progresses. At the same time, however, there may emerge certain kinds of complexing that appear regularly in a given text and are motivated by elements of the context of the speech. These patterns are often seen as a product of what is known as the style appropriate to a particular written or spoken genre (Denniston, 1954:66–70). However, more recently there has been work that relates clause complex types to particular features and purposes of the discourse in which they are found (Bolkestein, 1991).

21.4.3 Clause complexing patterns as symbolic of clarity and truth

In this section of the speech, certain kinds of clause complexing appear to be associated with the way in which Demosthenes attempts to portray himself as the person who sees the 'truth' of a situation, as opposed to other political players who do not. This is in part reflected in the different kinds of clause complexing associated with reporting his own actions, and the clause complexes that report the actions of others. With respect to the actions of others, the clause complexing in terms of taxis and logico-semantic relations is considerably intricate (see Table 21.5).

The first thing to note is that the clause complex has a highly subordinated structure which builds as the clause complex proceeds. Some of these subordinated levels in turn consist of paratactic elements. In terms of logico-semantic relations, there are a number of different types of relation, such as cause, time, elaboration and idea projection. Many of these relationships are not explicitly expressed through conjunctions, but are instead expressed through the relations between finite clauses (using finite forms of verbs, marked for person and number) and non-finite clauses that use participial or infinitival verbal forms. As a result, it is somewhat more difficult for the reader or hearer to determine at first glance a number of the logico-semantic relations between the clauses, and their meaning relationships. Of those relationships that are marked by a conjunction or particle, there is some loss of explicitness, because of the use of particles to mark some relations (which tend to have rather less explicit connecting force than full conjunctions) and the use of *kai* which, like English *and* (Halliday & Matthiessen, 2004:405, 411), can specify a number of kinds of logico-semantic relation such as a temporal sequence, or the addition of new information.

The overall effect is that of a clause complex whose structure and meaning is rather involved, placing a considerable burden on the audience to determine a precise picture of how the actions of these political figures are being portrayed. In order to interpret this patterning properly, we have to ask ourselves first whether this represents a 'failure' on Demosthenes' part to express himself

Table 21.5. *Tactically and logico-semantically intricate clause complexing*

Demosthenes 18.45.2 **Taxis and LS Label**	**Logico-semantic relation**	**Clause with translation**
a		*hai d' poleis enosoun,* ‖ the cities were ailing,
=b 1 1	**Elaborating: elaboration**	*tôn men men en tôi [[politeuesthai* ‖ *kai prattein]] dôrodokountôn* ‖ those involved in [[pursuing the life of active citizens]] being bribed
=b 1 =2	**Elaborating: elaborating**	*kai diaphtheiromenôn epi khrêmasi,* ‖ and being corrupted with money,
=b +2 a	**Extending: additive**	*tôn d' idiôtôn kai pollôn ta men ou proörômenôn,* ‖ individuals in the general population either not seeing it coming,
=b +2 xb 1	**Enhancing: causal-conditional: causal**	*_ta de têi kath' hemeran rhastônêi kai skholêi deleasdomenôn,* ‖ or being less than vigilant in their day-to-day indifference and indolence
=b +2 xb +2 xb	**Enhancing: causal-conditional: causal**	*kai toioutoni ti pathos peponthotôn hapantôn,* ‖ and when everyone had suffered such a calamity,
=b +2 xb +2 a 'b	**Projecting: idea**	*_plên ouk eph' heautous << >> to deinon hexein,* ‖
=b +2 xb +2 a a	**Extending: additive**	*<< hekastôn oiomenôn>>* <<each of them thought>> that the misfortune would come to everyone except to themselves,
=b +2 xb +3 a	**Extending: additive**	*kai dia tôn heterôn kindunôn ta heautôn asphalôs skhêsein* ‖ and that they would preserve their own security through the dangers endured by others
=b +2 xb +3 xb	**Enhancing: temporal: simultaneous**	*hotan boulôntai.* ‖‖ whenever they wanted

clearly to his audience. Judging from what we know of the context of this speech – Demosthenes' known effectiveness as an orator, his ensuing political success, the likely 'processing' of the text into a published and disseminated form – we may come to the conclusion that these contextual factors decrease the probability of an unintentional lack of clarity. The local co-text also reduces this likelihood further, as it shows evidence that there is attention to detail in the ordering of constituents of each of the clauses, where there is a clearly

Table 21.6. *Demosthenes' reporting of self through 'simpler' clause complexing*

Demosthenes 18.44.2		
xb	**Enhancing: causal-conditional: conditional**	*ei de mê êisthanonto,* ‖ if they were not realising it
a 1		*heteros logos houtos [^ESTI],* ‖ that [^IS] another story,
a =2	**Elaborating: elaborating**	*ou pros eme [^ESTI].* ||| [^IT IS] not to do with me.
Demosthenes 18.45.1		
1		*egô men gar proulegon* ‖ For I foretold this,
=2	**Elaborating: clarifying**	*kai diemarturomên kai par' humin aei kai [[hopoi pemphtheiên]];* ||| and I always bore witness to it, both in your presence and [[wherever I was sent]];

constructed parallelism between the governing and the governed social classes, and, at the morphological level, there is a repeating 'genitive absolute' construction at the end of many of the subordinate clauses, broken towards the end of the clause complex by two infinitives associated with indirect thought (Yunis, 2001:21). For these reasons, we may conclude that Demosthenes worded this passage deliberately, and thus that any lack of clarity is, in fact, deliberate.

Through the intricate clause complexing of this example, Demosthenes might therefore be assumed to be attempting to portray the actions of others as being complicated, disorganised, misleading or devious and, ultimately, wrong and misguided. This, the audience might presume, is the result of unenlightened thinking, and the lack of political and strategic wisdom and intelligence that engendered it. This becomes even more apparent when we compare this clause complex to others where Demosthenes' own actions are being talked about. Demosthenes talks about his actions in very 'plain' clause complexes, which are not that complex in terms of taxis or logico-semantic relations. A case in point is the two clause complexes (see Table 21.6) which precede the reporting of other states' actions as discussed above:

This kind of complexing stands in sharp contrast to the next clause complex that describes the actions of others and the consequences that they suffer. The whole complex is shorter, comprises at most two levels of taxis, and the

logico-semantic relations between clauses are quite unambiguous. In short, when Demosthenes represents himself to his audience, he portrays himself as 'simple' and 'direct', in contrast to other political figures in Athens and abroad, who are not. Indeed, this is part of an explicitly avowed strategy for the whole of his speech:

Demosthenes 18.58

||| *houtôsi men, ô andres Athenaioi, dikaiôs kai haplôs tên apologian egnôka poieisthai,*
|| *badioumai d' ep' auth' [[ha pepraktai moi]].* |||

||| 'In this way, men of Athens, I have decided to conduct my defence in a proper and simple way, || and I will proceed to those things [[which have been done by me]].' |||

Demosthenes is professing to be direct about what he has done, both explicitly, and implicitly through the grammar that he uses; the explicit and the implicit reinforce each other. In turn, this is meant to imply that Demosthenes is presumed to be the bearer of the 'truth' and enlightened political thinking in a complex and difficult world.

It is reasonable to assume that his audience would associate the lucidity and relative simplicity of the complexing with notions of 'plain speaking' and 'speaking the truth'. Through at least the century beforehand, educated Athenian audiences were well acquainted with the idea that speakers could be *deinoi* – 'clever', in both negative and positive senses (defined in Liddell *et al*., 1968:374; Wardy 1996:56–58) – and were well aware of the power of highly crafted speech to mislead, and of others' exhortations (famously, Socrates and Plato) to reject such 'sophistry' in the search for the 'unmediated truth'. There was a widely shared consciousness that complicated and ambitious schemes in political and social life can often lead to disaster – a lesson painfully learnt by Athens in its humiliating defeat by Sparta two generations before. Adopting the 'plain' style, as Demosthenes does here, is symbolic of reaching towards the truth, and he actively uses such symbolism – in this case mediated through deliberate choices in the clause complexing – to engender the trust of the audience in both what he is saying and his previous words and actions. In this way, the grammatical resources of the Greek language (in particular, the system of clause complexing) are exploited by Demosthenes in the service of the oratorical and persuasive functions of his speech – to encourage the audience to trust him, and to portray himself as having political intelligence superior to anyone else, either within Athens (particularly including his opponent Aeschines) or abroad. This feeds into *êthos*, a notion long recognised (and explicitly formulated by Aristotle) as an important requirement of persuasive talk in ancient

Greek: a representation of the moral character of the speaker to the audience that is intended to encourage the audience to believe in the speaker's authority and trustworthiness (Carey, 1994:34–38).

An important issue to address at this point is that this phenomenon is not simply an issue of oratorical 'style' in this case, without any motivation beyond trying to give the speech a certain 'texture'. The particular kinds of clause complexing have so far been examined largely as an issue of Demosthenes' style of speaking and/or writing. That is, the clause complexing is seen as mediating text rhythm and patterning, which in turn have a role as 'expected' or 'effective' features of the genre of oratory, or as part of the individuality of a particular speaker. Indeed, clause complexing patterns have been noted as part of Demosthenes' oratorical style, such as the use of repeating genitive absolute constructions in long complexes, and a general tendency to use a great variety of clause complexing taxis and logico-semantic relations, such variation being a valued feature of extended talk and writing (Yunis, 2001:17–26). The present chapter does not in any way contradict the stylistic role of such clause complexing, as both part of the style of the genre and the style of the individual speaker. What is being argued here is that clause complexing patterns go beyond this: they are also directly tied to the specific strategies in this particular speech, and to persuading others of Demosthenes' 'superiority'. One might say that the clause complexing not only has a role in the genre, but also the register. Additionally, the context is driving a wide range of different selections in the systems of TAXIS and LOGICO-SEMANTIC RELATIONS, where the probabilities of selection of each option tend towards equality with each other, thus leading to intricacy.

21.5 Choice and textual design

The above discussion has attempted to show that there are consistencies in selection in two lexicogrammatical systems which have some relation to factors in the context of situation in which Demosthenes crafts and delivers his speech. Specifically, there are consistencies in the selection of Theme that reflect the prominence of the major interactants in court, the prominence of major elements in the political environment, and the role of the *graphê paranomon* in classical Athenian legal and political culture. Their common 'thematicity' is used by Demosthenes to make a legal courtroom argument relevant to a political argument, and vice versa. Second, there are consistencies in selections of taxis in the clause complexing that are related to casting one party in a negative light and another in a positive light.

To Halliday, choice is one of the organising principles of language – a language is an "organisation as a huge network of interrelated choices"; it is also

intimately involved with the notion of meaning – "meaning is choice: selecting among options that arise in the environment of other options" (Halliday, 2003c:8). Ultimately, though, Halliday's language is open-ended about who or what is doing the selecting of options in a linguistic system, and certainly does not commit to the notion of psychological intention. On one reading, choice operates over linguistic phenomena related to each other, and these relations are theorised and modelled in terms of a system network.

However, in the case of Demosthenes' speech, we are not only talking about individual selections in linguistic systems, but also consistencies of selection and distributions of probability of selection across options, and their relationship to the semiotic and social context in which the production, transmission and reception of the speech is situated. Can we extend the notion of choice to denote a tendency to select one option over another over one or more linguistic systems, where consistencies of selection result in complex products of symbolism that resonate with important aspects of the context of a text? This is an abiding concern not only for Greek literature, but also in modern-day speechmaking (Thompson, this volume) and also complex acts of semiosis in many kinds of text and their relation to individual intention (see Butt, Moore & Tuckwell, this volume).

This in turn raises a number of questions. In a given context of situation, do we make choices about which aspects of that context have a bearing on choices we make at the linguistic strata, and thereby only make certain parameters of context meaningful? Or is there an alternative to the notion of choice that we can use?

The term 'choice' as used by Halliday and other SFL practitioners shares a certain element in common with other SFL terminology. The term has been introduced from another domain, and often from lay usage. English speakers use the term 'choice' frequently in all kinds of text, and the vast majority of those occurrences are not to do with linguistic theorisation. As a result, the term 'choice' is used in SFL with what one might call 'baggage' from its non-linguistic and lay usage, which complicates efforts to explicitly theorise how choice relates to meaning and linguistic systems. Like many other terms in SFL, 'choice' is a linguistic term whose functions and meanings in the theory are yet to be fully explicated.

An important alternative model to the notion of choice with the potential for better explanatory power – and one which Halliday has cited from his work in automated language systems (Halliday, 2003c:23–26) – is to think of choice as probabilities of systemic selection. In the case of Demosthenes' speech, we may say that the situation and context that Demosthenes was expected to engage in influenced the probabilities of selection in the semantic, lexicogrammatical and phonological systems of ancient Greek, with selection of particular options and the interstratal phenomenon of semogenesis resulting in the persistence

of patterns of selection that cumulatively build configurations of meaning in text. These feed forward into context, and subsequently condition selection probabilities of linguistic options. In this way, complex symbolic structures assemble and persist through Demosthenes' text.

Modelling systemic choice in terms of settings of system probabilities is not simply an alternative to using the term 'choice'; as in quantum mechanics, probability and indeterminacy are part of the nature of language. This means that *langue* (in Saussure's terms) operates as a complex adaptive system with associated notions of metastability, non-linear behaviour and threshold effects, feed-forward and feedback mechanisms, and the emergence, persistence and decay of particular kinds of linguistic and social practice in text (Beckner *et al*., 2009).

So in the case of Demosthenes' speech, the semantic configurations represent 'metastable' states of a text formed through self-organisation (Beckner *et al*., 2009:2–3). This self-organisation arises from the cumulative effect of consistent and interdependent selections, producing a configuration that is relatively stable, conditioned by certain aspects of the social and semiotic context. Understanding language and text in these terms is required to understand text−context relations and language variation, issues of interest to ancient language linguistics and literature more generally.

So, to what extent is Demosthenes choosing (in non-SFL terms) the language of his speech, if we are to consider his language in terms of being the product of complex adaptive systems, where no recourse is made to the notion of psychological intention? I suggest that the most psychologically conscious act of meaning that Demosthenes performs is his determination of what particular aspects of the semiotic and social context are to condition selection probabilities, which cumulatively feed forward into the linguistic systems to produce a textual design adaptive to the contextual settings and condition subsequent linguistic behaviour.

The large volumes of linguistic data and the computational tools required to bear out a complex systems view of language have been developed and are still being developed, with the emergence and growth of 'probabilistic linguistics' to model various kinds of linguistic phenomena (Bod *et al*., 2003). With regards to lexicogrammar, work is being done on the probabilities of co-selection of grammatical features in a clause and the computational prediction of grammatical structures given a particular semantic configuration based on the learning of observed probabilities of co-occurrence of linguistic features (see Manning, 2003). Further work in this area requires intensive collaboration between linguistics and those involved in statistical modelling and the information sciences. In the meantime, the notion of linguistic choice – carefully characterised and used – will continue to serve a valuable role in understanding relational linguistic systems and meaning. However, it will ultimately be a

conceptual entry point to more articulated and precise ways to characterise and model linguistic behaviour.

21.6 Conclusion

A number of conclusions can be drawn from the present inquiry into the language of Demosthenes and what it might say about the nature of linguistic choice.

This chapter in no way purports to be a complete exploration of those features of the grammar of the text that create meanings in the rhetoric of Demosthenes. Only two kinds of grammatical feature have been under examination here. Other issues can be areas of further study in Demosthenes and other orators in order to build a profile of what linguistic resources – grammar, lexis and semantics – are used in particular oratorical registers and genres. It is proposed here that these aspects of language characterised in SFL terms may also be subject to probability-based complex system modelling.

Through the selections of Theme from clause to clause, there is an alignment between the two potentially conflicting functions of a speech defending against a *graphê paranomon*. This is achieved by making major players in the political and strategic landscape, and major players in the court case (Aeschines and, effectively, Demosthenes) the prominent information element of many of the clauses. In this way, the personal enmity between the court combatants is made to be a microcosm of the military, diplomatic and strategic struggle between Macedonia and the Greek mainland states, and directly responding to the requirements of adversaries in the courtroom and legal situation.

The clause complexing patterns in the section under consideration play an important role in enabling Demosthenes to portray himself as being pre-eminent in political foresight and action, and therefore pre-eminent in *êthos*. This symbolism is achieved by reading the clause complexing against the surrounding cultural assumptions about styles of speaking, and in particular what kinds of speaking lead to what kinds of thinking and action. In short, the contextual situation results in the creation of metastable co-patterning in the ideational and textual grammar.

Thus there are two relatively complex pieces of meaning-making emergent in the text of Demosthenes' speech which are deeply connected to the context of situation. The selection of options in linguistic systems is the mechanism by which these phenomena develop and are sustained. It is suggested that multiple factors in the situation of context and culture – the particular nature of the *graphê paranomon*, the value attached to complex meaning-making in literary contexts, and the entrenched notion of acts of speaking having political and social consequences – provide the environment in which complex symbolism develops to sustain the portrayal of the public and political self in relation to

others, particularly in relation to the notion of one's *êthos*. To fully explore the emergence of complex text phenomena it may be necessary to move beyond the notion of choice, and to model language instances and systems in terms of probability and complex adaptive systems, in order to provide explanatory power for both the operation of individual linguistic systems and the conditioning of these systems to enable logogenetic, ontogenetic and phylogenetic change.[1]

[1] I would like to thank Associate Professor David Butt, Macquarie University, Australia, for his kind assistance, advice and encouragement in the course of preparation of this chapter.

22 Interlanguage lexicogrammatical fossilisation or not? That's an SFL-related question from the viewpoint of choice

Pedro Henrique Lima Praxedes Filho

22.1 Introduction

Within the area of Second Language Development (SLD), the main theorists of L2 learners' language or interlanguage (IL), Selinker (1992) and Ellis (1982, 1988, 1994), claim that IL develops – regardless of whether in a naturalistic setting or a classroom – along a continuum between the learners' mother tongue (L1) and the L2 variety being learned.[1] The continuum is said to feature an ever-increasing quantity of meanings and forms that are accumulated in successive stages (also called ILs: the initial IL or IL1, followed by IL2, IL3, etc.), with the first resulting from the learning strategy of semantic and lexicogrammatical simplification of the L2 variety, and the others from its semantic and lexicogrammatical complexification. The continuum is also characterised by the fact that, for the great majority of learners, the very last stage hardly ever coincides with the L2 variety as used by its native speakers, because of what they call fossilisation or the "cessation of IL learning, often far from T[arget]L[anguage] norms" (Selinker, 1992:243), regardless of age and the amount and quality of the instruction.

However, on the one hand, no SLD scholar has provided to date any detailed description of an IL continuum as regards (i) the meanings and forms that make up each of its stages, (ii) the emergence point in time of new stages, and (iii) the total number of stages, which means that fossilisation has never been described either semantically or lexicogrammatically. The most that has been achieved is the empirically based proposal that grammatical morphemes are learned in a fixed, and thus natural, order. Although the proposal has an empirical basis, researchers have not ever reached a consensus as to whether such a natural order really exists and if it is affected by classroom instruction; moreover, the number of morphemes studied amounts to only a few.[2] Besides, Ellis (1982)

[1] There is a consensus within the SLD area whereby IL is a language in its own right, functioning in the same way that natural languages do.

[2] Some of the most common ones are: *-ing* (in present progressive), *-s* (plural and third person singular), *-'s*, *-ed* (only past) vs. irregular past, (in)definite articles, *be* (as main and auxiliary verb in present progressive).

claims, also based upon empirical observation, that classroom L2 learners go through three stages: (i) semantic simplification and formulas, (ii) semantic implementation as well as bound and free grammatical morphemes, and (iii) more such morphemes. Yet, these findings are not, by any means, enough for an encompassing description of an IL continuum.

Perrett (2000), on the other hand, postulates that the concept of system networks proposed by Systemic Functional Linguistics (SFL) is powerful enough to make possible such a description. She states that, after the SLD researcher has chosen the stratum s/he is interested in describing in a longitudinal study, s/he collects spoken and/or written texts – which must all belong to the same register – from an L2 learner at regular intervals of time. Next, based upon the choices made in the texts, a system network is to be constructed for each data collection moment (Ct). Then, the networks relative to the Cts are to be compared chronologically as "[t]he changes that we see between time 1 and time 2 represent some of the developmental changes that have taken place. We can observe increases in delicacy, as learners make finer distinctions in meaning and the networks proliferate with branches to the right" (2000:96).

It is known that the natural order claimed by the morpheme approach to IL description is no more than an accuracy order that is supposed to reflect the so-called "built-in syllabus" of L2 learners (Corder, 1974:24). The order, after all, results from which morpheme, among those preselected by the researcher, is correctly supplied first, second, third, etc. in over 90 per cent of obligatory grammatical contexts furnished by some elicitation task. It is clear that the morpheme approach is mentalist/innatist and, accordingly, incapable of informing the contextual motivations of SLD. Although Ellis's (1982) study was based upon texts produced by L2 learners and his approach is socio-cognitivist rather than mentalist/innatist, his three stages are too general to be considered an effective description of an IL continuum. What SLD needs in order to make possible such a description is comprehensiveness in the sense that it has to account both for the expansion of L2 learners' resource/choice potential relative to all linguistic strata, and for the contextual motivations of the findings. As demonstrated by Perrett (2000), the systemic/choice dimension of SFL is the appropriate theoretical basis to adopt. Since no researcher will ever be able to cope with the description of all strata in a single project, she, in her study, chose to work at the semantic stratum, and hence used only semantic system networks for speech functions.

Therefore, there was a gap to be filled in terms of a lexicogrammatical description of an IL developmental continuum in terms of the first simplified stage and the subsequent ever more complexified ones. Praxedes Filho (2007), following Perrett (2000), carried out a longitudinal quantitative case study aimed at describing, from the theoretical viewpoint of SFL's systemic dimension, the classroom IL continuum of a Brazilian learner of American English

who used to study at the English Language Center (ELC A) in Fortaleza, Brazil, for the written register called personal-experience narrative (PE), in an attempt to: (i) identify the points in time when a new lexicogrammatical choice[3] was aggregated, meaning that a new stage had begun; (ii) figure out the total number of stages that composed the learner's continuum exclusively within the scope of his five years' EFL training time at ELC A; and (iii) characterise each stage by way of its aggregated choices. My option for SFL's systemic/choice dimension led me to refer to lexicogrammatical simplification and complexification as 'systemic lexicogrammatical simplification and complexification'.

One major difference between Perrett's study and mine was that while she constructed semantic system networks for the speech functions from the texts rendered by her subjects at each collection moment and compared them with the English-language network, I started out from preexisting English-language lexicogrammatical system networks for transitivity, mood[4] and theme, and traversed them for each text produced at the different collection moments so that I could have access to the selection expressions at clause rank. This was justified by my having been interested solely in the English-language contribution to the construal of the learner's IL continuum.

Given that it is SFL's systemic dimension that sees language as a potential, as a set of resources, as available choices, this chapter intends, in general terms, to make a contribution to the discussion on how the choices made by an L2 learner – inferred from texts he renders as his IL meaning potential develops over time – can be used to describe IL itself in a more encompassing way. The developing meaning potential has been approached exclusively from below, i.e. from its realisation as further choices are made in the lexicogrammatical stratum.

Since fossilisation[5] still lacks a lexicogrammatical description, this chapter aims at answering the following question: Does the learner who participated in Praxedes Filho (2007) as subject fossilise as regards the PE register in that his repertoire of lexicogrammatical choices stops increasing and, if so, how can his level of fossilisation be described in terms of the maximum repertoire of lexicogrammatical choices reached at graduation time from ELC A and in terms of its comparison with the repertoire of native speakers of American English for the same register?

In the remainder of the chapter, I will define the terms 'IL systemic lexicogrammatical simplification', 'IL systemic lexicogrammatical complexification', and 'IL systemic lexicogrammatical fossilisation' in Section 22.2. In

[3] 'Choice' here equals a term in a system network, among its mutually exclusive terms.

[4] Whenever reference is made to the mood system network, the modality network is intended to be included.

[5] Due to the same systemic/choice bias of the study reported on in this chapter, fossilisation may also be referred to as 'systemic fossilisation'.

Section 22.3 the methodology will be described, whilst in Section 22.4, I will review Praxedes Filho's (2007) results. Section 22.5 presents the results and discussion. Finally, in Section 22.6, I will present some concluding remarks.

22.2 IL systemic lexicogrammatical simplification–complexification and fossilisation

Unlike formalist grammars, Systemic Functional Grammar (SFG) is a paradigmatic or choice grammar: it has the system, rather than the structure, as its major organising principle. The former incorporates the signification it assumes within the Firthian tradition: language is polysystemic, being a system made up of systems. Thus, systems are understood as finite sets of terms/choices among which selections can be made. The systemic lexicogrammatical terms are then realised in structures, which are, hence, merely outcomes of the selections (Halliday, this volume).

Lexicogrammatical systems each have an entry condition, which is one of the ranks on the rank scale: the grammatical units of clause complex, clause, group and phrase, word, and morpheme. Once a rank has been defined as the entry condition into a system and one of its terms – to the exclusion of all others – has been selected, the selection made can become the entry condition into another, more delicate system. These interrelated systems constitute a system network. The more expanded to the right a network is, the more delicate it is. Therefore, the systems of a network are organised in accordance with what is named the scale of delicacy, whereby a network starts with systems whose terms are very general and is traversed, in a sideways movement to the right, through systems whose terms are ever less general until the systems whose terms are very specific are reached. For further review of the theoretical aspects of system networks, the reader is invited to refer to Halliday (this volume) and Hasan (this volume).

The English language lexicogrammatical system networks relevant to this study are those of transitivity, mood and theme, which have the clause as their entry condition. In order to make the study possible, I constructed rather delicate networks, one for each of the three lexicogrammatical layers, out of much less delicate ones scattered throughout Matthiessen (1995), as well as Halliday and Matthiessen (2004). The characteristics of these system networks are: the transitivity network contains 85 systems and 190 terms, with 7 levels of delicacy; the mood network has 74 systems and 162 terms, with 10 levels of delicacy; and the theme network has 68 systems and 164 terms, with 9 levels of delicacy. As for the three networks together, the total figures amount to 227 systems and 516 terms.

In accordance with these basic concepts, it is now possible to proceed to defining the constructs referred to earlier: IL systemic lexicogrammatical

complexification is a function of the increase in the quantity of English language systems and terms integrated into a learner's IL resource repertoire over time for a given register: the more transitivity, mood, and/or theme systems and terms have been integrated up to a given point in time, the more lexicogrammatically complexified the IL relative to the register under consideration is. This means that the IL rendered, within a register, at the first few stages of the continuum – due to its still small quantity of integrated English language systems and terms – is characterised by systemic lexicogrammatical simplification, which is expected to turn into complexification during the subsequent stages.

The manner in which a network's systems and terms spread topologically contributes to the refinement of the definition. Within each lexicogrammatical system network, the systems and terms increase in quantity whenever either of the following movements happens: (a) up and down inside the same level of delicacy (when, for some time, only new systems and terms that belong to the same level of delicacy are aggregated to the learner's IL continuum); or (b) rightwards across levels of delicacy (whenever the learner's IL continuum moves forward in complexity by way of the aggregation of new systems and terms that belong to the next level of delicacy as compared with the level to which the immediately previous systemic aggregations belong).

It follows that IL systemic lexicogrammatical fossilisation is the end of the increase in the quantity of English language transitivity, mood and theme systems and terms integrated into a learner's IL resource repertoire for a given register at some time before the end of the developmental continuum in the classroom and/or before it reaches the size of a native speaker's resource/choice repertoire relative to the same register. The second half of the definition is data-driven, since I felt the need for it as the analysis unfolded (cf. Section 22.5).

22.3 Methodology

As for the empirical rationale, this is a longitudinal quantitative case study. Due to the SFG-based definition of IL fossilisation, the question could only be dealt with thoroughly if there were a way of comparing the final classroom lexicogrammatical choice repertoire relative to the PE register reached by the learner against the total repertoire used by native speakers of American English upon producing texts that instantiated the same register. Hence, there was a need to gather data from two types of subject: (i) a non-native speaker (NNS), and (ii) native speakers (NSs).

22.3.1 Subjects

The potential NNS was chosen from Brazilian EFL students registered, in the 2003.2 academic term (i.e. in the second semester of 2003), in Stages 1, 3, 5,

7 and 9 at ELC-A (Stage(s) = S). Each of the specific stages provided one subject. The five subjects were followed through data collections until the end of the 2004.1 academic term and were selected by way of pre-collection and post-collection criteria.[6] However, for the sake of security, in case any of the preselected subjects dropped out along the way or failed the 2003.1 stage – all students in each of the five preselected classes participated in the data collection, carried out collectively in the respective classrooms and originating from the task of telling personal-experience narratives in writing.

The pre-collection criterion was based upon profile questionnaires that were applied to all students of all S1/3/5/7/9 classes during the first week of the academic term. The questionnaire used with the S1 students served the purpose of controlling the variables of (i) level of education, (ii) age, (iii) previous knowledge of English, (iv) stage of entrance (whether the student took any of the Juvenile-Course stages for children under thirteen), and (v) experience with English abroad. To be eligible as preselected subjects for potential participation, the S1 students had to hold the following profile: literate Brazilian EFL students (i) with age ranging between thirteen and twenty-five (as this is a case study, the results could only be valid for a single age group: adolescence and very young adulthood), (ii) with no or little previous knowledge of English, (iii) with entrance into ELC-A through S1, and (iv) with no living experience in English-speaking countries.

The questionnaires used with the S3/5/7/9 students aimed at controlling the same variables. However, two further questions were asked: (i) if the student's entrance was via a placement test, and (ii) what the student's age was when s/he first entered S1. In order to be eligible, the S3/5/7/9 students had to have the same profile as that of the preselected S1 students. Besides, the entrance of the former may not have been through a placement test, and their age when they started S1 was supposed to be the same as that of the latter.

As to the post-collection criterion, it relied upon the academic achievement of all students who had participated in the data collection. For the purpose of the selection process of the five effective subjects, I asked the course co-ordinator to provide me with the students' 2003.2 and 2004.1 final grades.

For the purpose of avoiding a result that would be valid only for either very successful learners or very poor ones, the five students definitively selected were those from among the preselected potential subjects, whose average grade for the two stages during which they had been studied was the closest to the

[6] The longitudinal data would have been ideal if only one subject had been accompanied from Stage 1 all the way through to Stage 10, which would have demanded a five-year data-collection period. In order to overcome time constraints, I made use of pre-collection and post-collection selection criteria, which made it feasible for the five male subjects to be considered, as closely as possible, as though they were one and the same person. That is the reason why 'NNS' stands for only the singular realisation of the respective nominal group: one non-native speaker subject.

global average grade for the respective two stages. For the global averages, the individual average grades for every two stages were rounded up.

There is an English Language Center in Fortaleza that maintains academic agreements with different American universities, whereby groups of undergraduate students from the US come to Brazil in order to have Portuguese-language lessons and experience of living in a Brazilian home for two months. When the need arose for NSs of American English as subjects, the ELC[7] had a newly arrived group of twelve undergraduates from the University of Pittsburgh, aged twenty to twenty-five. I then contacted the local co-ordinator, who said the group would be meeting the following day and I would be welcome to join them to let them know of my needs and find out about their willingness to participate.

Prior to the meeting, I had already worked out that the native-speaking population would have to be made up of six subjects. I needed a population size that could provide neither too small a corpus that would be considered unusable for its total lack of representativeness, nor too large a corpus that would make data categorisation unfeasible. Since native speakers attain a level of linguistic proficiency apparently unattainable to the most advanced non-native speakers, it occurred to me that a criterion as to the population size, for lack of a better one, would be the number of data collections the most advanced NNS was submitted to, that is, six, which coincided with being half of the whole group. At the meeting, I gave the students the necessary explanations and asked for six volunteers.

22.3.2 Corpora

Due to time constraints, data collection with the NNS could not exceed one calendar year – academic terms 2003.2 and 2004.1. Therefore, the data had to be divided into five subcorpora as follows: NNS-subcorpora one to five, made up of the IL rendered by the S1/3/5/7/9 potential subjects until they reached the end of S2/4/6/8/10.

The NNS corpus as a whole consists of thirty written narratives about a notable personal experience. The choice of the narrative rhetorical mode was motivated by the fact that it seems to be the most pervasive one as "all human beings live within ongoing narratives, and . . . we all make sense of our lives by constantly constructing narratives" (Meurer, 1998:23–24), and as such is the most representative of people's everyday lives. In terms of the field, the chosen topic was unrelated to the classroom in order that the produced texts were instances of a register located closer to Tarone's (1983) IL vernacular style (the most genuine IL) as, upon production, the subjects' attention tends to

[7] Henceforth, ELC-B.

be directed more towards the meanings to be conveyed than towards the forms that realise them due to the novelty of the topic.[8]

22.2.3 Data-collection procedures

As a first step towards data collection with the NNS, after the profile questionnaires had been administered and their results known, I conducted a half-day meeting with all the teachers whose classes had been preselected. The meeting was meant for me (i) to make them aware of every aspect of all the actions they were to take as data collectors based upon a sheet given out to them, with detailed printed instructions in Portuguese; and (ii) to hand them the material they were to use on the first data-collection session, including the potential subjects' sheets with instructions in Portuguese and enough blank space for the NNS to write the texts ((ii) was repeated at the remaining collection sessions).

Each of the five subcorpora was constructed along six data-collection sessions (Ct1/2/3/4/5/6), which happened at the three ELC-A general testing times in 2003.2 – September/November/December – as well as at the three general testing times in 2004.1 – March/May/June. All data collections took place in the potential subjects' classrooms. At each data-collection session, the task had to be done in a class period some time around the day reserved for ELC-A's written test. The teachers were free to schedule the day of the class period according to their own and their students' convenience. Within the limits of one single class period, there was no time control. However, the teachers were asked to encourage the students to turn in the data-collection sheet as soon as they had finished the task.

On each collection day, the teachers were also asked to provide all potential subjects with some necessary instructions. The instructions were intended for them: (i) to tell, by means of a written composition in English, a story, which could be a different one at each data-collection session (the task was not intended to measure memory), about any notable personal experience they had had; (ii) not to worry about grammar or spelling mistakes, but focus solely on content; (iii) not to use any reference resources, but rely strictly on the knowledge of English learned to date; (iv) to make use of any communication strategy in order to convey the ideas they wanted to but had not learned the wording for yet; (v) to resort, if necessary at the beginning stages, to only key words, like Tarzan's way of talking and, at all stages again if necessary, to paraphrases and/or Portuguese for unknown vocabulary; and (vi) not to write

[8] Tarone's (1983) vernacular style (lack of attention to form) and her careful style (attention to form) are the ends of the IL style continuum she proposed after the Labovian theory of natural-language variability according to social context, so as to demonstrate that it equally applies to ILs.

draft versions of the stories beforehand in order to keep the planning level as low as possible.[9] Regardless of the stage, all instructions were given in Portuguese to avoid misunderstandings.

The NSs rendered their texts only once. It was done under the same conditions as those the NNS was submitted to: (i) in a classroom at ELC-B; (ii) within a class period; and (iii) with lack of time control as to the completion of the task, provided that the whole allocated time did not exceed one class period. On data-collection day, they were provided with further instructions in English intended for them: (i) to tell, by means of a written composition in English, a story about any notable personal experience they had had (the instructions on the subjects' sheet were translated into English); and (ii) to not write draft versions of the stories beforehand.

22.3.4 Data categorisation procedures and analysis criteria

All IL texts were keyboarded. The keyboarding was faithful to the orthography used by the NNS, regardless of any non-standard features. The texts were then segmented into ranking and down-ranked clauses. Their categorisation was done in accordance with SFG's systemic or choice dimension.

The ranking and down-ranked clauses in the thirty texts were categorised for the selections of terms made by the NNS within the systems that form the transitivity, mood and theme networks I constructed (cf. Section 22.2). The analytical aim, then, was the unveiling of the selection expression relative to each clause of each text; thus, instead of using the realisation statements in the networks as the way into the clause structures via the selection expressions, I utilised the statements as the way into the selection expressions themselves. The analysis was done for one text at a time and, for each clause, I traversed each of the three networks to retrieve, based upon the realisation statements, the selection of terms that had generated the clause under scrutiny. The procedures are illustrated in Figure 22.1 with Clause 2 (C2) in the PE text produced by NS1 in regard to the unveiling of its transitivity selection expression.

After categorisation, the data were analysed quantitatively. The resulting absolute numbers for systems and terms were changed into simple frequency indices[10] and then into percentages.

[9] Instructions (ii) and (vi) have to do with the need to elicit, from the NNS, the IL vernacular style.

[10] Numbers of occurrences of a given linguistic feature per every 1,000 words of text (total occurrences of feature is divided by total words in texts of a given corpus and the result is multiplied by 1,000). This is a way of overcoming the problem of the different text lengths since production time was not controlled. Absolute numbers are not comparable as the longer a text is, the higher the occurrence of a linguistic feature tends to be (and vice-versa).

1/1||| My journey home [[to visit my family this past December for Christmas]] was a total disaster! **2/2|||**
Originally, my boyfriend was supposed to drive me home. 3/3||| It's a 6 hour drive from Pittsburgh to Scranton, 4‖ and he said 5‖ that it would be no problem 4/6||| . . .

		SELECTION EXPRESSIONS
C2	**Tr**	**[clause, effective, material, doing, transformative, enhancing 1, operative, location, place]**
	Md	[clause, major, free, indicative, declarative, modal, modulation, obligation, median, objective, implicit 4, full, positive 1]
	Th	[clause, unmarked topical theme, textual theme, conjunctive adjunct, enhancing, spatio-temporal, simple, preceding, external]

C2 – The first term is **'clause'** because it is the initial input feature/entry condition into the transitivity system network. The writer had then to choose among the terms of the three simultaneous systems AGENCY, PROCESS TYPE and CIRCUMSTANCE TYPE. As to the first system, the writer inserted the constituent *my boyfriend* as the Agent, which is the requirement of the realisation statement for the term **'effective'**. Regarding the second system, at the first delicacy level, the term **'material'** was chosen because the clause has the configurational function Actor – realised, through preselection, by the same nominal group *my boyfriend*, which is the requirement imposed by the term's realisation statement. At the second level of delicacy, the term **'doing'** is justified by the fact that it meets the requirements of its realization statement: There is a Goal realised, through preselection, by the nominal group *me*, which conflates with the configurational function Medium instead of Agent. Still at the second level of delicacy, the choice was for **'operative'** rather than 'receptive' since the requirements of the former term's realisation statement are met: (a) There is an Agent that preselects the nominal group *my boyfriend*; (b) the transitivity configurational function Agent is conflated with the mood configurational function Subject; (c) the transitivity configurational function Medium is conflated with the mood configurational function Complement, both being realised – through preselection – by the nominal group *me*; and (d) the process *to drive* is active. At the third level of delicacy – between 'creative' or 'transformative', the clause is **'transformative'** as the constituents *my boyfriend* and *me* are preexistent, that is, they were not created/made by the process *to drive*: The driving was supposed to be done to *me* by *my boyfriend*. At the fourth level of delicacy, the transformation has to do with motion/location shift; hence, the term **'enhancing 1'** is the one in the selection expression in place of 'extending'/addition or 'elaborating 1'/restatement. As for the third system, the constituent *home* is a circumstance because it is only loosely involved in the process.

Figure 22.1. Systemic categorisation for C2 in the PE text produced by NS1

The analysis was made for the purpose of describing the developmental continuum of the NNS IL in terms of the systemic lexicogrammatical simplification and complexification learning strategies and the systemic lexicogrammatical fossilisation phenomenon. For the description itself, the systems and terms within the transitivity, mood and theme networks were considered simultaneously.

The criterion used to define the boundaries of each IL stage was that of the first appearance of a given transitivity, mood or theme system out of the systems that make up the respective networks, rather than the 90 per cent accuracy criterion derived from the morpheme studies. Ellis (1994) names these criteria emergence/onset criterion and accurate-use criterion, respectively. My option for the former lay in the fact that it is more in tune with the social basis of SFL: the spontaneous emergence of a given lexicogrammatical system in the NNS's

IL is motivated by some specific demand of the classroom-related context of situation the NNS is involved in routinely (instructional register).

In order to opt for the emergence criterion, I relied upon the SFL-based presupposition whereby the NNS was capable of meeting the demand of the instructional register for a new transitivity, mood or theme system. Accordingly, the first emergence of the same new system in his PE texts – irrespective of its accuracy in terms of its configurational realisation in the English variety being taught – was, in turn, a response to a demand of the research-related context of situation the NNS was submitted to (investigational register). Thus, the spontaneous re-use of the new system in the NNS's PE text suggests that it must have already been integrated into his lexicogrammatical repertoire of choices.

All that was said about the data-categorisation procedures used with the NNS is also valid concerning those utilised to categorise the data elicited from the NSs. The analysis of the latter set of data was again of the quantitative type and was meant to have its results compared with those relative to the analysis of the former set. In other words, the analytical criterion was the comparison between the sizes of the NNS's and NSs' choice repertoires relative to the three lexicogrammatical networks.

22.4 A review of Praxedes Filho's (2007) results

The results in this review will be presented mostly by means of Figure 22.2. Figure 22.2 provides an idea of the general characteristics of the NNS's IL developmental continuum – only up to the seventh data-collection session[11] – from the perspective of SFL's systemic or choice dimension. It shows, among other features, the points in time when there was the first appearance of a new transitivity or mood or theme system from those within the respective networks.

It was determined, in Section 22.3.4, that such a first appearance would mark the start of a new IL stage, whose implication is that the lack of the simultaneous appearance of a new transitivity and mood and theme system means the learner remains at the same stage. Figure 22.2 shows that there was an appearance of new systems at each of the first six data-collection sessions and that no new systems appeared at the seventh session, which means that the NNS's classroom IL developmental continuum has six IL stages or ILs

[11] A figure displaying the results relative to the thirty data-collection sessions was not included because of space constraints. Nevertheless, the subsequent top headings are: **S3Ct2/*IL6→7***, **S3Ct3/*IL7→8***, **S4Ct4/*IL8→9***, **S4Ct5/*IL9→10***, **S4Ct6/*IL10→11***, **S5Ct1/*IL11→12***, **S5Ct2/*IL12→13***, **S5Ct3/*IL13→14***, **S6Ct4/*IL14→15***, **S6Ct5/*IL15→16***, **S6Ct6/*IL16→17***, **S7Ct1/*IL17→18***, **S7Ct2/*IL18***, **S7Ct3/*IL18***, **S8Ct4/*IL18***, **S8Ct5/*IL18→19***, **S8Ct6/*IL19→20***, **S9Ct1/*IL20→21***, **S9Ct2/*IL21→22***, **S9Ct3/*IL22→23***, **S10Ct4/*IL23***, **S10Ct5/*IL23***, **S10Ct6/*IL23→24***.

S1Ct1/*IL1*	S1Ct2/*IL1→2*	S1Ct3/*IL2→3*	S2Ct4/*IL3→4*	S2Ct5/*IL4→5*	S2Ct6/*IL5→6*	S3Ct1/*IL6*
TRANSITIVITY TERMS	**TRANSITIVITY TERMS**	**TRANSITIVITY TERMS**	**TRANSITIVITY TERMS**	**TRANSITIVITY TERMS**	**TRANSITIVITY TERMS**	**TRANSITIVITY TERMS**
eventive happening location material middle place **SYSTEMS** AGENCY PROCESS-TYPE CIRC.-LOCATION TYPE- MATERIAL1 CIRC. PLACE TYPE- HAPPENING	as locution indicating mental1 perceptive phenomenal phenomenalisation ranged receiver reporting specific time2 verbal1 verbalisation visual **SYSTEMS** PHENOMENALITY1 SENSING VERBALISATION ADDRESS CIRC TIME1 RANGING PHENOMENALITY2 TYPE-PERCEPTION TYPE-VERBALISATION TYPE MODALITY TYPE LOCUTION PROJECTION-OF-MOOD	ascriptive behavioral circumstance-as-attribute circumstantial doing effective elaborating1 expanding intensive non-phase operative quality1 quality1 as attribute relational transformative **SYSTEMS** EFFECTIVE-VOICE TYPE BEING TYPE DOING RELATIONAL-ABSTRACTION RELATION TYPE TRANSFORMATION-OUTCOME PHASE CIRCUMSTANTIAL-ASCRIPTION NATURE ATTRIBUTE QUALITY1	accompaniment comitative **SYSTEMS** CIRC.-ACCOMPANIMENT CIRC.-COMITATIVE	additive class decoding identifying **SYSTEMS** CIRC.-ADDITIVE DIRECTION-IDENTIFYING	**NO NEW** TERM OR **SYSTEM**	creative **NO NEW SYSTEM**
MOOD TERMS	**MOOD TERMS**	**MOOD TERMS**	**MOOD TERMS**	**MOOD TERMS**	**MOOD TERMS**	**MOOD TERMS**
bound enhancing expansion hypotactic major non-finite perfective positive1 **SYSTEMS** CLAUSE-CLASS FREEDOM POLARITY FINITENESS BINDING TYPE NON-FINITE-TYPE EXPANSION-CLAUSE-TYPE BOUND-CLAUSE-TYPE	declarative extending finite free full imperfective indicative past1 present1 temporal 'to' 'zero' **SYSTEMS** MOOD TYPE CLAUSAL-ELLIPSIS INDICATIVE-TYPE DEICTICITY CLAUSAL-PRIMARY-TENSE PERFECTIVE-CLAUSE-TYPE	explicit3 implicit3 interactant non-exclamative speaker **SYSTEMS** INDICATIVE-MOOD-PERSON DECLARATIVE-TYPE INTERACTANT-TYPE DECLARATIVE-SUBJECT-PRESUMPTION	speaker-plus **NO NEW** **SYSTEM**	**NO NEW** TERM OR **SYSTEM**	indirect proposition projection **SYSTEMS** INDIRECT-MOOD-TYPE	elaborating **NO NEW** **SYSTEM**
THEME TERMS	**THEME TERMS**	**THEME TERMS**	**THEME TERMS**	**THEME TERMS**	**THEME TERMS**	**THEME TERMS**
as-transitivity-role circumstance-theme marked-topical-theme unmarked-topical-theme **SYSTEMS** TOPICAL-THEME THEME-MATTER TYPE-TRANSITIVITY-ROLE-THEME	conjunction hypotactic paratactic structural textual theme **SYSTEMS** TEXTUAL THEME TEXTUAL-THEME-TYPE2 TYPE-STRUCTURAL-THEME TYPE-CONJUNCTION-THEME	definite process theme relative pronoun **SYSTEMS** TYPE-RELATIVE-PRONOUN-THEME	**NO NEW** TERM OR **SYSTEM**	**NO NEW** TERM OR **SYSTEM**	non-subject-(complement)-participant-theme **NO NEW** **SYSTEM**	**NO NEW** TERM OR **SYSTEM**

Figure 22.2. New transitivity, mood and theme terms and systems aggregated to NNS's IL choice repertoire up to the seventh data-collection session

up to this point. There was further aggregation of new systems from the eighth to the nineteenth data-collection sessions (twelve ILs), from the twenty-third to the twenty-seventh (five ILs), and at the thirtieth data-collection session (one IL), which indicates that the IL developmental continuum of the so-to-say 'sole' NNS (cf. footnote 6) is made up of twenty-four ILs, considering only the time span he spent receiving formal instruction at ELC A, i.e. only until his graduation from ELC A.

Except for IL1, all of the others are thus represented in Figure 22.2: IL1→2 . . . IL23→24. This representation is to account for the fact that the ILs are non-discrete, as it was demonstrated, within the scope of the whole project, that in all cases at least one system from the immediately previous IL reappears in the subsequent new IL.[12] This leads to the evidence that the classroom IL developmental continuum described here is cline-like rather than discrete (a claim by some SLD scholars), which is more in tune with the SFL position of rejecting dichotomies and isolated linguistic entities.

The fact that the so-to-say 'sole' NNS's IL continuum under investigation in the study reported on in this chapter contains twenty-four ILs made me question the likely limitations of the traditional tripartite classification of the L2 classroom proficiency levels (beginning−intermediate−advanced) and want to propose some other classification based upon SFL's systemic dimension. As a result, I thought an effective criterion whereby the boundaries of each level could be demarcated would result from the intersection between the moments when the NNS traverses any of the networks to a higher level of delicacy (the systemic-complexification rightward movement) and the moments when he moves from a given IL stage to the next. Each new proficiency level, then, commences whenever there is a delicacy-level rightward movement, provided that there is also a concomitant IL stage-shift. Each level terminates at the moment that immediately precedes the next delicacy-level movement. Since Proficiency Level 1 has to start at the very first data-collection session because it coincided with the instruction beginning at ELC A's S1 and variables were controlled to ensure that the NNS had begun instruction with none or almost no previous knowledge of EFL, only the final-demarcation criterion is applicable.

The NNS goes through, for PE, seven proficiency levels. Their demarcations and the respective IL shifts that occur at each initial demarcation are as follows: (1) **P**(roficiency) **L**(evel) **P**(ersonal) **E**(xperience)**1** – S1Ct1/IL1, (2)

[12] Figure 22.2 shows that, for example, IL6 emerges out of IL5, but their intersections cannot be inferred from the same figure as it brings only the new terms and systems per data-collection session. However, the analysis of the NNS's data revealed that, considering only the first level of delicacy as an illustration, the transitivity systems AGENCY, PROCESS TYPE, CIRCUMSTANCE LOCATION and CIRCUMSTANCE ACCOMPANIMENT, the mood system CLAUSE CLASS, and the theme systems TOPICAL THEME and TEXTUAL THEME are shared by IL5 and IL6.

PLPE2 – S1Ct2/IL1→IL2, (3) **PLPE3** – from S1Ct3/IL2→IL3 to S5Ct1, (4) **PLPE4** – S5Ct2/IL12→IL13, (5) **PLPE5** – from S5Ct3/IL13→IL14 to S6Ct4, (6) **PLPE6** – S6Ct5/IL15→IL16, and (7) **PLPE7** – from S6Ct6/IL16→IL17 to S10Ct6.

22.5 Results and discussion

As with the first part of the question posed in Section 22.1 (whether the NNS fossilises regarding PE in that his repertoire of lexicogrammatical choices stops increasing before graduation time), the answer is 'no' if only the first half of the systemic lexicogrammatical fossilisation definition is taken into account (the end of the increase in the quantity of transitivity, mood and theme systems and terms integrated into a learner's IL repertoire some time before the end of the continuum . . .). The non-fossilisation answer is due to the following: (i) Figure 22.2 and footnote 11 evidence that the NNS had new systems and terms relative to the three networks integrated into his IL up to graduation time, as the beginning of the last IL (IL 24) coincides with the last data-collection session (S10Ct6); and (ii) further analysis shows that his IL choice repertoire reached the penultimate transitivity level of delicacy – the sixth – and the last mood and theme levels of delicacy – the tenth and ninth, respectively. Moreover, the move towards the highest levels of delicacy occurred rather early: within the first third of the data-collection sessions for transitivity and within the second third for mood and theme.

However, Halliday (1978a:14) admits that the only stratum in which he did not fossilise in his use of Chinese was phonology: "I never became a native speaker in the lexico-grammar, still less in the semantics; and I never shall". Such a categorical assertion made me decide both on expanding the definition of systemic lexicogrammatical fossilisation by adding its second half (. . . and/or before it reaches the size of a native speaker's choice repertoire relative to the same register) and, hence, on resorting to NSs as subjects. The justification for such a decision derives from the fact that a register is linguistic variation to which Matthiessen (1993) offers a common-core-system-plus-partition type of possible interpretation, whereby, lexicogrammatically, the system networks of the whole language encompass the system networks of all registers. Registerial variation results, thus, from this subset (partition of total system)−whole (common-core system) relationship. Therefore, an answer to the research question based solely upon the result provided by the NNS can be misleading due to the lack of knowledge about the extension of the lexicogrammatical systemic subsets that characterise PE as rendered by native speakers. Table 22.1 presents the results relative to both the NNS and the NSs.

Table 22.1. *Quantities of Transitivity, Mood and Theme systems and terms (non-)used by the NNS and NSs in relation to the totals of Transitivity, Mood and Theme systems and terms*

				Absolute number	Simple frequency index	Percentage
Total transitivity, mood and theme systems				227	101.2	100%
NNS	Used systems	At S1Ct1		17	7.6	7.5%
		At S10Ct6	By NNS and NSs	164	73.3	72.4%
			By NNS only[a]	1	0.4	0.4%
	Non-used systems	AtS10Ct6		62	27.5	27.2%
NSs	Used systems			194	86.6	85.6%
	Non-used systems			33	14.6	14.4%
Gross difference between systems used by NNS and NSs				30	13.3	13.2%
Systems absent from syllabus[b]				0	0.0	0.0%
Net difference between systems used by NNS and NSs				30	13.3	13.2%
Total transitivity, mood and theme terms				516	230.3	100%
NNS	Used systems	At S1Ct1		18	8.1	3.5%
		At S10Ct6	By NNS and NSs	250	111.5	48.4%
			By NNS only	2	0.9	0.4%
	Non-used systems	AtS10Ct6		264	117.9	51.2%
NSs	Used terms			325	145.0	63%
	Non-used terms			191	85.3	37%
Gross difference between terms used by NNS and NSs				75	33.5	14.6%
Terms absent from syllabus				2	0.9	0.4%
Net difference between terms used by NNS and NSs				73	32.6	14.2%

[a] Whenever there are systems and terms that were used by only the NNS, they must be disregarded for the purpose of calculating the gross difference between the systems and terms used by the NNS and the NSs.

[b] The systems and terms used only by the NSs (gross difference) were checked against the syllabus the NNS had followed. Each item was looked up in all textbooks adopted at ELC-A. The net difference in favour of the NSs results from the subtraction of the absent systems and terms as, theoretically, the NNS was not exposed to them in the classroom.

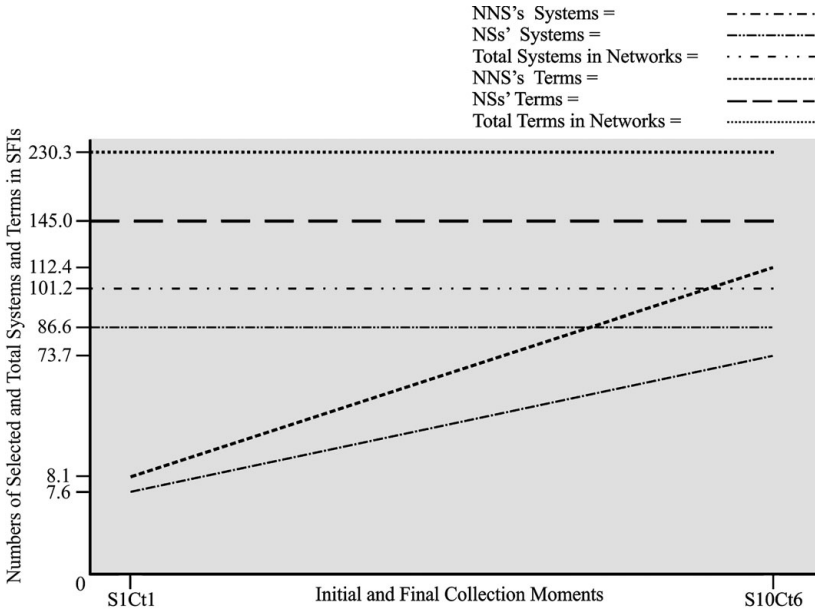

Figure 22.3. Comparison between the number of effective selected transitivity, mood and theme systems and terms by the NNS and the NSs and the totals of systems and terms within the three system networks

Table 22.1 shows that the NNS's system repertoire increases from 7.5% – out of the 101.2 systems within the networks – to 72.8% (considering the 0.4% of systems used only by the NNS), which means that 27.2% of the total systems were not utilised. The increase for the term repertoire is from 3.5% – out of the 230.3 terms within the systems – to 48.8% (considering the 0.4% of terms used only by the NNS), which implies a non-utilisation of 51.2% of the total terms. While the NSs' system repertoire is made up of 85.6% of the total systems that belong to all three networks, their term repertoire comprises 63% of the general total of terms, signifying that the NNS presents system and term gaps of 13.2% (not considering the 0.4% of systems used only by the NNS) and 14.6% (not considering the 0.4% of terms used only by the NNS), respectively. Whereas the 13.2% gap represents the net system difference in favour of the NSs, the 14.6% gap represents the gross term difference. The net term difference in favour of the NSs is 14.2%, which derives from the subtraction of the gross difference and the 0.4% of terms absent from the syllabus taught to the NNS.

These results are presented graphically in Figure 22.3.

Corroborating Matthiessen (1993), Figure 22.3 clearly demonstrates that, along the instantiation cline, the NSs' lexicogrammatical systems' repertoire (_.._) and terms' repertoire (_ _ _) for PE are subsets – constituting a subpotential – of the whole English-language potential relative to its systems' (. . _ _ . .) and terms' (. . . . .) repertoires. As compared with the whole English-language potential, the lexicogrammatical systems' repertoire (_ . _ . _) and terms' repertoire (-------) for PE of the so-to-say 'sole' NNS are also subsets, constituting another subpotential. What makes the NNS different from the NSs is that his subpotential is much smaller than theirs both for systems and terms when he graduates from ELC A after five years' training in EFL. In addition, Figure 22.3 also makes clear that the NNS's IL developmental continuum is systemically simplified at the beginning (only 7.6 systems and 8.1 terms at S1Ct1/IL1). From then on, it starts complexifying and remains so until graduation time (73.7 systems and 112.4 terms at S10Ct6/IL24); however, it does not reach the NSs' level of systemic lexicogrammatical complexification within the NNS's instruction period.

In accordance with these results, the answer to the first part of the question turns to 'yes', which is licensed by the second half of the definition. However, the positive answer can only be said to be indicative of the existence of systemic fossilisation due to the tentative status of the lexicogrammatical systemic description of PE. The tentativeness of the description, in turn, is a consequence of its not having resulted from a large corpus, which means it holds low representativeness (Teich, this volume).

Despite the limitation just referred to, it makes complete sense to answer the second part of the question: how the NNS's level of fossilisation can be described in terms of both the maximum repertoire reached at graduation time and its comparison with the repertoire of native speakers of American English for PE. Whereas the description in terms of the repertoire reached at graduation time has to do with the illustrative contents of Figure 22.2, the description from the viewpoint of the comparison with the NSs' repertoire was accomplished through the comments derived from Table 22.1 and Figure 22.3.

Although the tendency is more towards a positive rather than a negative answer to the existence of systemic fossilisation, I think it reasonable to raise the following hypothesis to be verified in subsequent research: If L2 learners are provided with favourable classroom conditions, there will not be systemic IL fossilisation. If this proves to be the case, it will lead me to claim that the semantic and lexicogrammatical systemic open-endedness of L1 developmental Phase III (Halliday, 1975) can also turn out to characterise the last classroom IL stage provided that the L2 learner, upon graduating from the ELC, never stops being a learner by way of not refusing to accept the challenge of effectively participating in the day-by-day local contexts of social situation where her/his broader context of culture calls her/him to function with the L2. The strategy

of continual learning even after instruction cessation need not be pursued for the purpose of achieving native-likeness (perfection), but for the purpose of augmenting her/his lexicogrammatical choice repertoire (success)[13] according to the meanings that s/he comes to have the need for conveying as determined by those L2-demanding contexts of social situation.

22.6 Concluding remarks

For the Brazilian-Portuguese-speaking students who participated as the NNS subject and as regards their rendering of PE, I would say that the objective of answering the first half of the research question (whether the NNS fossilises regarding PE in that his repertoire of lexicogrammatical choices stops increasing before graduation time) was fully met from the perspective of the successful completion of the investigational process itself. In relation to the first part of the question's second half (how the NNS's level of fossilisation can be described in terms of the maximum repertoire reached at graduation time), there was a problem, which has to do with the fact that there was not enough space in this chapter to show the already accumulated repertoire of systems and terms per IL stage in Figure 22.2. When it comes to the second part of the question's second half (how the NNS's level of fossilisation can be described in terms of his maximum repertoire as compared with that of the native speakers of American English for PE), I would say that the objective was also attained, but partially. To state, in a more definitive manner, that systemic fossilisation does exist, it is essential that the systemic lexicogrammatical description of the PE register produced by native speakers of American English be based upon a much larger corpus. Hence, it is advisable that the (non-)existence of systemic fossilisation be further investigated. One seemingly feasible way of accomplishing this would be by means of a longitudinal study with an ELC graduate whose occupation requires her/him to use English regularly, such as tourist guides or hotel staff.

Furthermore, the attainment of the objective as a whole does not mean that the gap, within the SLD area, concerning the lack of a lexicogrammatical description of fossilisation, was filled due to the case-study status of the research reported on here. Thus, there is a need for other genuinely longitudinal studies with groups of NNSs[14] from different English Language Centers, rendering

[13] Halliday (1978a) associates the ideas of L2 success with the SFL concept of language as resource, and L2 perfection with the formalist concept of language as rule.

[14] Moita Lopes (1996), based mainly upon the argument that IL speakers are capable of understanding one another because their IL behaves as natural languages do, proposes an extension of IL theory so that it can also account for the IL of groups of people. He posits that his claim is feasible when the group of people shares "the same L1 dialect, the same IL proficiency, the same social experience, and the same motivation" (1996:118, my translation). This is almost always true for a group of learners sharing the same L1 and learning the same L2 in a given

both the same register and others as well. Such further research must be carried out from the viewpoint of the systemic or choice dimension of SFL, as what was attained here was made possible by the descriptive power of such a comprehensive theoretical approach. Another research perspective that opens up is the attempt that should be made towards the construction of system networks for each IL stage along the developmental continuum that are based only upon the IL data themselves, aiming at the elimination of the L2 bias from the description. After all, ILs are natural languages (cf. footnotes 1 and 14).

When such a research project is finished, SLD researchers will certainly have a sounder basis upon which to go on pursuing their studies. More importantly, teachers of English as an additional language will have at their disposal a clearer idea of the fossilisation process, the 'real' IL stages their students go through, and the lexicogrammatical choice repertoire available at each stage, but these still need to be expanded by way of more effective pedagogy. What I mean by a more effective pedagogy is instruction not only in the L2 through a communicative genre-based syllabus but also about the L2 through SFL's systemic and functional dimensions in accordance with the Sydney School teaching/learning cycle (Martin, 2009). These are the favourable classroom conditions I referred to earlier, following Miller (2006a), when I raised the systemic non-fossilisation hypothesis.

I hope this chapter has achieved its more encompassing purpose of making a contribution to the discussion on how the systemic or choice dimension of SFL can theoretically and methodologically inform IL research in the SLD area in a more competent fashion than theories that are exclusively cognitive in orientation.

class, at a given Language Center. He further claims that this wider view "makes it theoretically possible to deal with the IL of a group of pupils and, hence, draw conclusions on their ILs" (1996:120, my translation).

References

Abbott, Barbara. 1993. A pragmatic account of the definiteness effect in existential sentences. *Journal of Pragmatics*, 19, 39–55.

1997. Definiteness in existentials. *Language*, 73, 103–108.

Abdel Latif, M. 2008. A state-of-the-art review of the real-time computer-aided study of the writing process. *International Journal of English Studies*, 8(1), 29–50.

Adams K. 1999. Deliberate dispute and the construction of oppositional stance. *Pragmatics*, 9(2), 231–248.

Albrow, K. H. 1972. *The English Writing System: notes towards a description* (Programme in Linguistics and English Teaching, Papers Series 2, Volume II). London: Schools Council.

Alonso Belmonte, I. & McCabe, A. 2003. Improving text flow in ESL learner compositions. *The Internet TESL Journal*, IX/3.

Alverez, J. & Emory, E. 2006. Executive function and the frontal lobes: a meta-analytic review. *Neuropsychological Review*, 16(1), 17–42.

Andersen, P. 2002. Dynamic semiotics. *Semiotica*, 139(1/4), 161–210.

Antilla, R. 2003. Analogy: the warp and woof of cognition. In Joseph, B. & Janda, R. (eds.), *The Handbook of Historical Linguistics*. Oxford & Malden, MA: Blackwell, 425–440.

Arbib, M. 2003. *The Handbook of Brain Theory and Neural Networks*. 2nd edn. Cambridge, MA: MIT Press.

ARCHER = A Representative Corpus of Historical English Registers 1990–1993/2000. Compiled under the supervision of Biber, D. & Finegan, E. at Northern Arizona University, University of Southern California, University of Helsinki and Uppsala University.

Ariel, M. 1996. Referring expressions and the +/– coreference distinction. In Fretheim, T. & Gundel, J. (eds.), *Reference and Referent Accessibility*. Amsterdam: Benjamins, 13–35.

Aron, A. R. 2007. The neural basis of inhibition in cognitive control. *Neuroscientist*, 13(3), 1−15.

Asp, E. 1995. Knowledge and laughter: an approach to a socio-cognitive linguistics. In Fries, P. & Gregory, W. (eds.), *Discourse in Society: Systemic Functional Perspectives: meaning and choice in language: studies for Michael Halliday*. Norwood: Ablex, 141−158.

Asp, E. & deVilliers, J. 2010. *When Language Breaks Down: analysing discourse in clinical contexts*. Cambridge University Press.

Aston G. & Burnard, L. 1997. *The BNC Handbook: exploring the British National Corpus with SARA*. Edinburgh University Press.

Bache, C. 1985. *Verbal Aspect: a general theory and its application to present-day English*. Odense University Press.

1997. *The Study of Aspect, Tense and Action: towards a theory of the semantics of grammatical categories*, 2nd rev. edn. Berlin: Peter Lang.

2008. *English Tense and Aspect in Halliday's Systemic Functional Grammar: a critical appraisal and an alternative*. London: Equinox.

2010. Hjelmslev's glossematics: a source of inspiration to Systemic Functional Linguistics? *Journal of Pragmatics*, 42, 2562–2578.

Badre, D. 2008. Cognitive control, hierarchy, and the rostro-caudal axis of the frontal lobes. *Trends in Cognitive Sciences*, 12, 193–200.

Badre, D. & Wagner, A. 2005. Frontal lobe mechanisms that resolve proactive interference. *Cerebral Cortex*, 15(12), 2003–2012.

2007. Left ventrolateral prefrontal cortex and the cognitive control of memory. *Neuropsychologia*, 45, 2883–2901.

Baker, C. 1973. *Definiteness and Indefiniteness in English*. Bloomington: Indiana University Linguistics Club.

Baker, P., Gabrielatos, C., Khosravinik, M., Krzyzanowski, M., McEnery, T. & Wodak, R. 2008. A useful methodological synergy? Combining critical discourse analysis and corpus linguistics to examine discourses of refugees and asylum seekers in the UK press. *Discourse & Society*, 19(3), 273–306.

Banks, D. 2008. *The Development of Scientific Writing: linguistic features and historical context*. London: Equinox.

Bartlett, T. 2012. *Hybrid Voices and Collaborative Change: contextualising positive discourse analysis*. London: Routledge.

Bassler, B. 2009. How bacteria communicate – TED talk. Available at <http://www.ted.com/talks/bonnie_bassler_on_how_bacteria_communicate.html> (last accessed 13 April 2013).

Bateman, J. 1986. *Text Planning for a Systemic Functional Grammar of Japanese* (Technical Report). University of Kyoto.

1990. Upper modelling: organizing language for natural language processing. In *Proceedings of the 5th International Workshop on Natural Language Generation*, Pittsburgh, 54–61.

1991. Decision making in text generation: towards a negative definition? In Meteer, M. & Zukerman, I. (eds.), *Proceedings of IJCAI Workshop on Decision Making throughout the Generation Process*. Sydney: IJCAI-91.

1994. *The KPML Development Environment*. Darmstadt: GMD/IPSI.

1997. Enabling technology for multilingual natural language generation: the KPML development environment. *Journal of Natural Language Engineering*, 3(1), 15–55.

2008. Systemic Functional Linguistics and the notion of linguistic structure: unanswered questions, new possibilities. In Webster, J. (ed.), *Meaning in Context: strategies for implementing intelligent applications of language studies*. London: Continuum, 24–58.

Bateman, J. & Henschel, R. 2007. Generating text, diagrams and layout appropriately according to genre. In Sluis, van der I., Theune, M., Reiter, E. & Krahmer, E. (eds.), *MOG 2007: workshop on Multimodal Output Generation*. Enschede: Universiteit Twente, 29–40.

Bayley, P. & Bevitori, C. 2009. 'Just war', or Just 'war'. Arguments for doing the right thing. In Morley J. & Bayley, P. (eds.), *Corpus Assisted Discourse Studies on the Iraq Conflict: wording the war*. London: Routledge, 74–107.

Beckner, C., Blythe, R., Bybee, J., Christiansen, M. H., Croft, W., Ellis, N. C., Holland, J., Ke, J., Larsen-Freeman, D. & Schoenemann, T. 2009. Language is a complex adaptive system: position paper. *Language Learning*, 59(s1), 1–26.

Bernstein, B. 1990. *Class, Codes and Control Vol. IV: the structuring of pedagogic discourse*. London: Routledge.

2000 [1996]. *Pedagogy, Symbolic Control and Identity: theory, research, critique*. New York: Rowman and Littlefield.

Berry, M. 1975. *An Introduction to Systemic Linguistics: I structures and systems*. London: Batsford.

1977. *An Introduction to Systemic Linguistics: II levels and links*. London: Batsford.

1981. Systemic linguistics and discourse analysis: a multi-layered approach to exchange structure. In Coulthard, M. & Montgomery, M. (eds.), *Studies in Discourse Analysis*. London: Routledge & Kegan Paul, 120–145.

1995. Thematic options and success in writing. In Ghadessy, M. (ed.), *Thematic Development in English Texts*. London: Pinter, 55–84.

1996. What is theme? A(nother) personal view. In Berry, M., Butler, C., Fawcett, R. P. & Huang, G. (eds.), *Meaning and Form: Systemic Functional interpretations*. New Jersey: Ablex, 1–64.

2013. Contentful and contentlight subject themes in informal spoken English and formal written English. In O'Grady, G., Bartlett, T. & Fontaine, L. (eds.), *Choice in Language: applications in text analysis*. London: Equinox, 243−268.

In preparation. Interpersonal meanings in letters from politicians.

Bevitori, C. 2007. En*gender*ing conflict? A corpus-assisted analysis of women MPs' positioning on the war in Iraq. In Dossena, M. & Jucker, A. (eds.), (Re)volutions in evaluation, *Textus*, 20(1), 137–158.

2010. Gendered discourses on war at the intersection between party affiliation and institutional role: the case of legislative assemblies. Invited speech at *Gender and Language – BAAL Special Interest Group, Gender and Corpus Linguistics Event*, University of Lancaster, 30 March 2010.

Biber, D. 1988. *Variation across Speech and Writing*. Cambridge University Press.

1993. Using register-diversified corpora for general language studies. *Computational Linguistics*, 19, 219−241.

1994. An analytical framework for register studies. In Biber, D. & Finegan, E. (eds.), *Sociolinguistic Perspectives on Register*. Oxford University Press, 31–56.

2006. *University Language: a corpus-based study of spoken and written registers*. Amsterdam: Benjamins.

2009. A corpus-driven approach to formulaic language in English. *International Journal of Corpus Linguistics*, 14(3), 275–311.

Biber, D. & Conrad, S. 1999. Lexical bundles in conversation and academic prose. In Hasselgard H. & Oksefjell, S. (eds.), *Out of Corpora*. Amsterdam: Rodopi, 181–190.

Biber, D., Finegan, E. & Atkinson, D. 1994. ARCHER and its challenges: compiling and exploring a representative corpus of historical English registers. In Fries, U., Tottie, G. & Schneider, P. (eds.), *Creating and Using English Language Corpora*. Amsterdam: Rodopi, 1–14.

Biber, D., Johansson, S., Leech, G., Conrad, S. & Finegan, E. 1999. *Longman Grammar of Spoken and Written English*. Harlow: Longman.

Binder, J. 2012. Task induced deactivation and the 'resting' state. *NeuroImage*, 62, 1086–1091.

Binder, J., Desai, R., Graves, W. & Conant, L. 2009. Where is the semantic system? A critical review and meta-analysis of 120 functional neuroimaging studies. *Cerebral Cortex*, 19, 2767–2796.

Binkofski, F., Amunts, K., Stephan, K., Posse, S., Schormann, T., Freund, H.-J., Zilles, K. & Seitz, R. 2000. Broca's region subserves imagery of motion: a combined cytoarchitectonic and fMRI study. *Human Brain Mapping*, 11(4), 273–285.

Birch, C. L. 1999. *Biology and the Riddle of Life.* Sydney: University of New South Wales Press.

Birch, D. & O'Toole, L. (eds.) 1988. *Functions of Style*. London: Pinter.

Bird, S., Klein, E. & Loper, E. 2009. *Natural Language Processing with Python – analyzing text with the Natural Language Toolkit*. Sebastopol, CA: O'Reilly.

Birner, B. 1998. Recency effects in English inversion. In Walker, M., Joshi, A. & Prince, E. (eds.), *Centering Theory in Discourse*. Oxford: Clarendon Press, 309–323.

Birner, B. & Ward, G. 1998. *Information Status and Noncanonical Word Order in English*. Amsterdam: Benjamins.

Blommaert, J. 2005. *Discourse: a critical introduction*. Cambridge University Press.

2008. Bernstein and poetics revisited: voice, globalisation and education. *Discourse and Society*, 19(4), 425–452.

Bod, R., Hay, J. & Jannedy, S. 2003. *Probabilistic Linguistics*. Cambridge, MA: MIT Press.

Bode, S., He, A. H., Soon, C. S., Trampel, R., Turner, R. & Haynes, J.-D. 2011. Tracking the unconscious generation of free decisions using ultra-high field fMRI. *PloS ONE*, 6(6): e21612.

Bohm, D. 1980. *Wholeness and the Implicate Order*. London: Routledge & Kegan Paul.

Bolinger, D. 1977. *Meaning and Form*. London: Longman.

Bolkestein, A. 1991. Causally related predications and the choice between parataxis and hypotaxis in Latin. In Coleman, R. (ed.), *New Studies in Latin Linguistics: selected papers from the 4th International Colloquium on Latin Linguistics, Cambridge, April 1987*. Amsterdam: Benjamins, 427–451.

Bookheimer, S. 2002. Functional MRI of language: new approaches to understanding the cortical organization of semantic processing. *Annual Review of Neuroscience*, 25, 151–188.

Boorman, E., Behrens, T., Woolrich, M. & Rushworth, M. 2010. How green is the grass on the other side? Frontopolar cortex and the evidence in favour of alternative courses of action. *Neuron*, 62, 733–743.

Bourdieu, P. 1977. The economics of linguistic exchanges. *Social Science Information*, 16(6), 645–668.

1991. *Language and Symbolic Power*. Cambridge: Polity Press.

Bowcher, W. 1999. Investigating institutionalisation in context. In Ghadessy, M. (ed.), *Text and Context in Functional Linguistics*. Amsterdam: Benjamins, 141–176.

2006. Networking the field of page-based instructional multimodal texts. In Amano, M. (ed.), *Multimodality: towards the most efficient communications by humans*

(Proceedings of the Sixth International Conference: Studies for the Integrated Text Science), Graduate School of Letters, Nagoya University, 1–16.

2007. Field and multimodal texts. In Hasan, R., Matthiessen, C. & Webster, J. (eds.), *Continuing Discourse on Language*. London: Equinox, 619–646.

Breivik, L. 1989. On the causes of syntactic change in English. In Breivik, L. & Jahr, E. (eds.), *Language Change: contributions to the study of its causes*. Berlin: Mouton de Gruyter, 29–70.

1999. On the rhetorical function of existential *there*. *Nordlit*, 6, 3–14.

2000. On relative clauses and locative expressions in English existential sentences. *View[z]*, 9(1), 6–28.

Breivik, L. & Martínez-Insua, A. 2008. Grammaticalization and non-concord in existential sentences. *English Studies*, 89(3), 351–362.

Brennan, S., Walker Friedman, M. & Pollard, C. 1987. A Centering approach to pronouns. In *Proceedings of the 25th Annual Meeting of the Association for Computational Linguistics*. Stanford, CA: Association of Computational Linguistics, 155–162.

Bridwell, L., Sirc, G. & Brooke, R. 1985. Revising and computing: case studies of student writers. In Freedman, S. (ed.), *The Acquisition of Written Language: revision and response*. Norwood: Ablex, 172–194.

Britton, J., Burgess, T., Martin, N., McLeod, A. & Rosen, H. 1975. *The Development of Writing Abilities [11−18]*. London: Macmillan.

Brown, G. & Yule, G. 1983. *Discourse Analysis*. Cambridge University Press.

Buckner, R., Andrews-Hanna, J. & Schacter, D. 2008. The brain's default mode network: anatomy, function, and relevance to disease. *Annals of the New York Academy of Sciences*, 1124, 1–38.

Burgess, P., Gonen-Yaacovi, G. & Volle, E. 2011. Functional neuroimaging studies of prospective memory: what have we learnt so far? *Neuropsychologia*, 49, 2246–2257.

Burnard, L. & Todd, T. *Xaira 1.25* (current release). Oxford University Computing Services.

Butler, C. 1985. *Systemic Linguistics: theory and application*. London: Batsford.

2002. On being true to form: models of syntax in Systemic Functional Grammar. *Functions of Language*, 9(1), 61–86.

2003. *Structure and Function: a guide to three major structural-functional theories. Part I: approaches to the simplex clause* (Studies in Language Companion Series, 63). Amsterdam: Benjamins.

2009. Lexical phenomenon in Functional Discourse Grammar and Systemic Functional Linguistics. In Slembrouck, S., Taverniers, M. & Van Herreweghe, M. (eds.), *From* will *to* well. *Studies in Linguistics offered to Anne-Marie Simon-Vanderbergen*. Gent: Academia Press, 55–67.

Butt, D. 1977. The teleological description of language. Unpublished ms, Department of English, University of New South Wales.

2001. Firth, Halliday and the development of systemic functional theory. In Auroux, S., Koerner, K., Niederehe, H.-J. & Versteegh, K. (eds.), *History of the Language Sciences. An international handbook on the evolution of the study of language from the beginnings to the present*, vol. 2. Berlin: Mouton De Gruyter, 1806–1838.

2004. Parameters of context: on establishing the similarities and differences between social processes. Mimeo.
2005. Method and imagination in Halliday's theory. In Hasan, R., Matthiessen, C. & Webster, J. (eds.), *Continuing Discourse on Language: a functional perspective*, vol. 1. London: Equinox, 81−116.
2008a. Whiteheadian and functional linguistics. In Weber, M. & Desmond, W. (eds.), *Handbook of Whiteheadian Process Thought*. Frankfurt: Ontos Verlag, 23−34.
2008b. The robustness of realizational systems. In Webster, J. (ed.), *Meaning in Context: implementing intelligent applications of language studies*. London: Continuum, 59–83.
2011. Process and pragma: J. R. Firth and semantic 'phase space'. Mimeo.
Butt, D. & Lukin, A. 2009. Stylistic analysis: construing aesthetic organisation. In Halliday, M. A. K. & Webster, J. (eds.), *Continuum Companion to Systemic Functional Linguistics*. London: Continuum, 190–215.
Butt, D. & Wegener, R. 2007. The work of concepts: context and metafunction in the Systemic Functional model. In Hasan, R., Matthiessen, C. & Webster, J. (eds.), *Continuing Discourse on Language: a functional perspective*, vol. 2. London: Equinox, 589–618.
Carey, C. 1994. Rhetorical means of persuasion. In Worthington, I. (ed.), *Persuasion: Greek rhetoric in action*. London: Routledge, 26–68.
Castel, V. 2009a. On the choice of logical forms in the generation of research paper abstracts. Paper presented at the *21st European Systemic Functional Linguistics Conference and Workshop*, University of Cardiff, Wales.
2009b. GeneSys_IDE: Entorno integral de desarrollo de gramáticas orientadas a la generación de textos. Software para la especificación de gramáticas sistémico-funcionales en el marco del modelo de Cardiff. Las lenguas española e inglesa como casos testigos. Project 06/G485, CONICET y UNCuyo, Mendoza, Argentina.
2010a. Introducción. In Castel, V. (ed.), *El artículo científico en inglés. Aspectos teórico-descriptivos, pedagógicos y computacionales de una modelización sistémico-funcional*. Mendoza: FFyL, UNCuyo, 13–25.
2010b. Generación asistida de *abstracts*: micro-planificación experiencial del 'Anuncio de la investigación'. In Castel, V. (ed.), *El artículo científico en inglés. Aspectos teórico-descriptivos, pedagógicos y computacionales de una modelización sistémico-funcional*. Mendoza: FFyL, UNCuyo, 219–268.
Castel, V. & Villar, M. 2009. Escritura asistida de folletos de promoción turística en línea con tecnología XML. Paper presented at the *V Congreso de la Asociación de Lingüística Sistémica Funcional de América Latina*, Universidad de Mar del Plata, Argentina.
Catani, M., Jones, D. & Ffytche, D. H. 2005. Perisylvian language networks of the human brain. *Annals of Neurology*, 57, 8–16.
Catani, M. & Mesulam, M. 2008. The arcuate fasciculus and the disconnection theme in language and aphasia: history and current state. *Cortex*, 44, 953–961.
Catani, M. & Thiebault de Schotten, M. 2008. A diffusion tensor imaging tractography atlas for virtual *in vivo* dissections. *Cortex*, 44(8), 1105–1132.
Cavanna, A. & Trimble, M. 2006. The precuneus: a review of its functional anatomy and behavioural correlates. *Brain*, 129, 564–583.

Chan, A., Liu, H.-L., Yip, V., Fox, P., Gao, J.-H. & Tan, L. 2004. Neural systems for word meaning modulated by semantic ambiguity. *NeuroImage*, 22(3), 1128–1133.

Charniak, E. 1993. *Statistical Language Learning*. Cambridge, MA: MIT Press.

Charteris-Black, J. 2006. Britain as a container: immigration metaphors in the 2005 election campaign. *Discourse & Society*, 17(5), 563–581.

Cherchi, M. 2000. *Challenges in the Investigation of Cerebral Function: neuroanatomical substrates of language processing*. Muenchen: LINCOM GmbH.

Chomsky, N. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.

Christ, O. 1994. A modular and flexible architecture for an integrated corpus query system. In *Proceedings of the 3rd Conference on Computational Lexicography and Text Research (COMPLEX 94)*, Budapest, Hungary, 23–32.

Chwilla, D. & Kolk, H. 2005. Accessing world knowledge: evidence from N400 and reaction time priming. *Cognitive Brain Research*, 25, 589–606.

Cloran, C. 1987. Negotiating new contexts in conversation. *Occasional Papers in Systemic Linguistics*, 1, 85–110.

1994. *Rhetorical Units and Decontextualisation: an inquiry into the relations of context, meaning and grammar* (Monographs in Systemic Linguistics). Nottingham University.

1999. Context, material situation and text. In Ghadessy, M. (ed.), *Text and Context in Functional Linguistics*. Amsterdam: Benjamins, 177–217.

2010. Rhetorical unit analysis and Bakhtin's chronotope. *Functions of Language*, 17(1), 29–70.

Cloran, C., Butt, D. & Williams, G. (eds.) 1996. *Ways of Saying: Ways of Meaning. Selected Papers of Ruqaiya Hasan*. London: Cassell.

Coffin, C. & O'Halloran, K. 2005. Finding the global groove: theorising and analysing dynamic reader positioning using appraisal, corpus and a concordancer. *Critical Discourse Studies*, 2(2), 143–163.

2006. The role of appraisal and corpora in detecting covert evaluation. *Functions of Language*, 13(I), 77–110.

Collier, R. 1983. The word processor and revision strategies. *College Composition and Communication*, 34(2), 149–155.

Comrie, B. 1976. *Aspect*. Cambridge University Press.

Cook, G. 1990. Transcribing infinity: problems of context presentation. *Journal of Pragmatics*, 14(1), 1–24.

Corder, S. 1974. The significance of learners' errors. In Richards, J. (ed.), *Error Analysis: perspectives on second language acquisition*. London: Longman, 19–27.

Cortes, C. & Vapnik, V. 1995. Support-vector networks. *Machine Learning*, 20(3), 273–297.

Dale, R. & Reiter, E. 1995. Computational interpretations of the Gricean maxims in the generation of referring expressions. *Cognitive Science*, 19, 233–263.

Damasio, H., Tranel, D., Grobowski, T., Adolphs, R. & Damasio, A. 2004. Neural systems behind word and concept retrieval, *Cognition*, 92, 179–229.

Daneš, F. 1974. Functional Sentence Perspective and the organization of the text. In Daneš, F. (ed.), *Papers on Functional Sentence Perspective*. Prague: Academia, 106–128.

Darwin, C. 1998 [1859]. *The Origin of Species*. New York: The Modern Library.

Davidse, K. 1992. A semiotic approach to relational clauses. *Occasional Papers in Systemic Linguistics*, 6. Nottingham University.

1996. Turning grammar on itself: identifying clauses in linguistic discourse. In Butler, C., Berry, M., Fawcett, R. P. & Guowen, H. (eds.), *Meaning and Form: systemic functional interpretations*. Norwood: Ablex, 367−393.

1999. The semantics of cardinal versus enumerative existential constructions. *Cognitive Linguistics*, 10, 203–250.

Davies, E. 1979. *On the Semantics of Syntax: mood and condition in English*. London: Croom Helm.

Davies, M. 2008. The Corpus of Contemporary American English: 425 million words, 1990−present. Available online at <http://corpus.byu.edu/coca/>.

Davies, P. & Gregersen, N. (eds.) 2010. *Information and the Nature of Reality: from physics to metaphysics*. Cambridge University Press.

De Beule, J. 2007. Compositionality, hierarchy and recursion in language: a case study in Fluid Construction Grammar. Unpublished PhD thesis, VUB Artificial Intelligence Lab, Brussels.

Deacon, D., Grose-Fifer, J., Yang, C.-M., Stanick, V., Hewitt, S. & Dynowska, A. 2004. Evidence for a new conceptualization of semantic representation in the left and right cerebral hemispheres. *Cortex*, 40, 467–478.

Deacon, T. 2010. What is missing from theories of information? In Davies, P. & Gregersen, N. (eds.), *Information and the Nature of Reality: from physics to metaphysics*. Cambridge University Press, 146–169.

Degaetano-Ortlieb, S., Kermes, H., Lapshinova-Koltunski, E. & Teich, E. in press. SciTex – a diachronic corpus for analyzing the development of scientific registers. In Bennett, P., Durrell, M., Scheible, S. & Whitt, R. (eds.), *New Methods in Historical Corpus Linguistics: corpus linguistics and interdisciplinary perspectives on language (CLIP)*, vol. 3. Tübingen: Narr.

Denniston, J. 1954. *Greek Particles*. Indianapolis: Hackett Publishing.

Derewianka, B. 2001. Pedagogical grammars: their role in English language teaching. In Burns, A. & Coffin, C. (eds.), *Analysing English in a Global Context: a reader*. London: Routledge, 240–269.

Dijk, T. van 1977. *Text and Context: explorations in the semantics and pragmatics of discourse*. London: Longman.

2006. Politics, ideology and discourse. In Brown, K. (ed.), *Encyclopaedia of Language and Linguistics*. Oxford: Elsevier, 728–740.

Dik, H. 1994. Ancient Greek warfare − a case study in constituent ordering. In Engberg-Pedersen, E. & Jakobsen, L. F. (eds.), *Function and Expression in Functional Grammar*. Berlin: Mouton de Gruyter, 197−213.

1995. *Word Order in Ancient Greek: a pragmatic account of word order variation in Herodotus*. Amsterdam: Gieben.

Dik, S. 1997. *The Theory of Functional Grammar. Part I: the structure of the clause*. 2nd edn. Hengeveld, E. (ed.). Berlin: Mouton de Gruyter.

Dillon, D. & Pizzagalli, D. 2007. Inhibition of action, thought, and emotion: a selective neurobiological review. *Applied and Preventive Psychology*, 12, 99–114.

Dilts, M. (ed.) 2002. *Demosthenis orationes, vol. 1* (Oxford Classical Texts). Oxford: Clarendon Press.

Dronkers, N., Wilkins, D., Van Valin Jr., R., Redfern, B. & Jaeger, J. 2004. Lesion analysis of the brain areas involved in language comprehension. *Cognition*, 92, 145–177.

Dunbar, R. & Shultz, S. 2007. Evolution in the social brain. *Science*, 317(5843), 1344−1347.

Dunn, M., Greenhill, S., Levinson, S. & Gray, D. 2011. Evolved structure of language shows lineage-specific trends in word-order universals. *Nature*, 473, 79−82.

Eckart, R. & Teich, E. An XML-based data model for flexible representation and query of linguistically interpreted corpora. In Rehm, G., Witt, A. & Lemnitzer, L. (eds.), *Data Structures for Linguistic Resources and Applications – Proceedings of GLDV 07*, Tübingen, April 2007. Tübingen: Narr, 327–336.

Edelman, G. 2006. *Second Nature: brain science and human knowledge*. New Haven, CT: Yale University Press.

Edelman, G. & Tononi, G. 2000. *A Universe of Consciousness: how matter becomes imagination.* New York: Basic Books.

Eemeren, F. van & Grootendorst, R. 2004. *A Systematic Theory of Argumentation: the pragma-dialectical approach*. Cambridge University Press.

Eggins, S. 1994. *An Introduction to Systemic Functional Linguistics*. London: Pinter.

Ellis, R. 1982. The origins of interlanguage. *Applied Linguistics*, 3, 207–223.

1988. *Classroom Second Language Development: a study of classroom interaction and language acquisition*. London: Prentice Hall.

1994. *The Study of Second Language Acquisition*. Oxford University Press.

Emig, J. 1971. *The Composing Processes of Twelfth Graders*. Urbana, IL: National Council of Teachers of English.

Enkvist, N. 1987. Text strategies: single, dual, multiple. In Steele, R. & Threadgold, T. (eds.), *Language Topics: essays in honour of Michael Halliday*, vol. II. Amsterdam: Benjamins, 203–211.

Escobar, A. 1995. *Encountering Development: the making and unmaking of the Third World*. Princeton University Press.

Evans, N. & Levinson, S. 2009. The myth of language universals: language diversity and its importance for cognitive science. *Behavioural and Brain Sciences*, 32, 429–492.

Fairclough, N. 2000. *New Labour, New Language?* London: Taylor & Francis.

Fawcett, R. P. 1980. *Cognitive Linguistics and Social Interaction: towards an integrated model of a Systemic Functional Grammar and the other components of an interacting mind*. Heidelberg: Julius Groos and Exeter University.

1981 [1973]. Generating a sentence in Systemic Functional Grammar. In Halliday, M. A. K. & Martin, J. (eds.), *Readings in Systemic Linguistics*. London: Batsford, 146–183.

1988. Language generation as choice in social interaction. In Zock, M. & Sabah, G. (eds.), *Advances in Natural Language Generation*, vol 1. London: Pinter, 27–49.

1992. Language as program: a reassessment of the nature of descriptive linguistics. *Language Sciences*, 14(4), 623–657.

1994. On moving on on ontologies: mass, count and long thing things. In McDonald, D. (ed.), *Proceedings of the Seventh International Workshop on Natural Language Generation*. Waltham, MA: Association for Computational Linguistics, Brandeis University, 71–80.

1998. Equivalence rules in an algorithm for generating five types of theme. *COMMUNAL Working Papers No 8*. Cardiff University.
2000. *A Theory of Syntax for Systemic Functional Linguistics*. Amsterdam: Benjamins.
2003. *A Generative Systemic Functional Micro-grammar for Some Central Elements of the English Clause*. Cardiff University.
2004a. *Extracts from THE SYSTEM NETWORK AND REALIZATION RULES FOR 'THING' showing systems that enter into the generation of MODIFIERS and QUALIFIERS in the ENGLISH NOMINAL GROUP*. Cardiff University.
2004b. *The Mini-grammar of GeneSys Version 5. Basic meanings realized in the clause other than transitivity: register, mood, time, aspect, validity, polarity, coordination, information focus and subject theme*. Cardiff University.
2008. *Invitation to Systemic Functional Linguistics through the Cardiff Grammar: an extension and simplification of Halliday's Systemic Functional Grammar*, 3rd edn. London: Equinox.
2011. Problems and solutions in identifying processes and participant roles in discourse analysis, Part 1: introduction to a systematic procedure for identifying processes and participant roles. *Annual Review of Functional Linguistics Vol 3*. Beijing: Higher Education Press, 34–87.
forthcoming a. *The Functional Semantics Handbook: analyzing English at the level of meaning*. London: Equinox.
forthcoming b. *An Integrative Architecture for Systemic Functional Linguistics and Other Theories of Language*. London: Equinox.

Fawcett, R. P. & Castel, V. 2006. *Software for GeneSys: prototype generator 3*. Cardiff University.

Fawcett, R. P. & Tucker, G. 1990. Demonstration of GeneSys: a very large, semantically based Systemic Functional Grammar. In *Proceedings of COLING 90*, vol. 1. Stroudsburg, PA: Association for Computational Linguistics, 38–49.

Fawcett, R. P., Tucker, G. & Lin, Y. 1993. How a Systemic Functional Grammar works: the role of realization in realization. In Horacek, H. & Zock, M. (eds.), *Natural Language Generation*. London: Pinter, 114–186.

Fawcett, R. P., van der Mije, A. & van Wissen, C. 1988. Towards a systemic flowchart model for discourse structure. In Fawcett, R. P. & Young, D. (eds.), *New Developments in Systemic Linguistics*, vol. 2. London: Pinter, 116–143.

Ferstl, E. & von Cramon, D. 2002. What does the fronto-median cortex contribute to Theory of Mind? *NeuroImage*, 17, 1599–1612.

Ferstl, E., Neumann, J., Bolger, C. & von Cramon, D. 2008. The extended language network: a meta-analysis of neuroimaging studies on text comprehension. *Human Brain Mapping*, 29, 581–593.

Firth, J. R. 1957. *Papers in Linguistics 1934–1951*. Oxford University Press.
1968 [1957]. A synopsis of linguistic theory, 1930–55. In Palmer, F. (ed.) *Selected Papers of J. R. Firth 1952–59*. London: Longman, 168–205.

Flower, L. & Hayes, J. 1981. A cognitive process theory of writing. *College Composition and Communication*, 32(4), 365–387.

Flynn, J. 2007. *What is Intelligence?* Cambridge University Press.

Fontaine, L. 2008. A Systemic Functional approach to referring expressions: reconsidering postmodification in the nominal group. Unpublished PhD thesis, Cardiff University.

Fontaine, L. & Aldridge, M. In preparation. A classification of interference errors in spontaneous language production.

Ford, A., McGregor, K., Case, K., Crosson, B. & White, K. D. 2010. Structural connectivity of Broca's area and medial frontal cortex. *NeuroImage*, 52(4), 1230–1237.

Foucault, M. 1984. *The Foucault Reader*. Rabinow, P. (ed.). Harmondsworth: Penguin.

Frake, C. 1961. The diagnosis of disease among the Subanum of Mindanao. *American Anthropologist*, 63, 113–132.

Fraňová, M. 1990. Constructive matching – explanation based methodology for inductive theorem proving. In Dassow, J. & Kelemen, J. (eds.), *Aspects and Prospects of Theoretical Computer Science; LNCS 464*. New York: Springer-Verlag, 138–147.

2008. *Créativité Formelle: méthode et pratique – Conception des systèmes 'informatiques' complexes et brevet épistémologique*. Paris: Publibook Université.

Freddi, M. 2004. *Functional Grammar: an introduction for the EFL student*. Vol. 1. in *Functional Grammar Studies for Non-Native Speakers of English*, Quaderni del Centro di Studi Linguistico-Culturali (CeSLiC), series editor D. R. Miller. Bologna: Alm@-DL – AMS ACTA. Available online at <http://amsacta.cib.unibo.it/867/>.

2006. *Functional Grammar: an introduction for the EFL student*. Bologna: Clueb.

Freeze, R. 1992. Existentials and other locatives. *Language*, 68, 553–595.

Friederici, A., Fiebach, C., Schlesewsky, M., Bornkessel, I. & von Cramon, D. 2006. Processing linguistic complexity and grammaticality in the left frontal cortex. *Cerebral Cortex*, 16, 1709–1717.

Fries, P. 1995. Themes, methods of development, and texts. In Hasan, R. & Fries, P. (eds.), *On Subject and Theme: a discourse functional perspective*. Amsterdam: Benjamins, 317–359.

Fries, P. & Gregory, W. (eds.) 1995. *Discourse in Society: Systemic Functional perspectives: meaning and choice in language: studies for Michael Halliday*. New Jersey: Ablex.

Gagarin, M. 1994. Probability and persuasion: Plato and early Greek rhetoric. In Worthington, I. (ed.), *Persuasion: Greek rhetoric in action*. London: Routledge, 46–68.

Garrido, M., Kilner, J., Kiebel, S., Stephan, K., Baldeweg, T. & Friston, K. 2009. Repetition suppression and plasticity in the human brain. *NeuroImage*, 48(1), 269−279.

Gelfand, J. R. & Bookheimer, S. Y. 2003. Dissociating neural mechanisms of temporal sequencing and processing phonemes. *Neuron*, 38, 831−842.

Ghadessy, M. 1993. *Register Analysis: theory and practice*. London: Pinter.

Glasser, M. & Rilling, J. 2008. DTI tractography of the human brain's language pathways. *Cerebral Cortex*, 18, 2471–2482.

Gleason, H. 1964. The organization of language: a stratificational view. In Stuart, C. (ed.), *Report of the Fifteenth Annual (First International) Round Table Meeting on Linguistics and Language Studies* (Monograph Series on Languages and Linguistics, 17). Washington: Georgetown University Press, 75–95.

Gold, B., Balota, D., Kirchhoff, B. & Buckner, R. 2005. Common and dissociable activation patterns associated with controlled semantic and phonological processing: evidence from fMRI adaptation. *Cerebral Cortex*, 15(9), 1438–1450.

Gold, B. & Buckner, R. 2002. Common prefrontal regions coactivate with dissociable posterior regions during controlled semantic and phonological retrieval. *Neuron*, 35, 803–812.

Goodwin, C. & Duranti, A. 1992. Introduction. In Duranti, A. & Goodwin, C. (eds.), *Rethinking Context: language as an interactive phenomenon*. Cambridge University Press, 1–42.

Gouveia, C. 2003. Critical discourse analysis and the development of the new science. In Weiss, G. & Wodak, R. (eds.), *Critical Discourse Analysis: theory and interdisciplinarity*. Basingstoke: Palgrave, 47–62.

Goźdź-Roszkowski, S. 2006. Frequent phraseology in contractual instruments. In Gotti, M. & Giannoni, D. (eds.), *New Trends in Specialized Discourse Analysis*. Bern: Peter Lang, 147–161.

Graber, P. 2001. Context in text: systemic functional analysis of the parable of the sower. Unpublished PhD thesis, Emory University, Atlanta.

Greenfield, S. 2000. *The Human Brain: a guided tour.* New York: Basic Books

Gregory, M. 1967. Aspects of varieties differentiation. *Journal of Linguistics*, 3(2), 177–274.

1985. Towards communication linguistics: a framework. In Benson, J. & Greaves, W. (eds.), *Systemic Perspectives on Discourse*, vol. 1. Norwood: Ablex, 119–134.

Grésez, J. & Decety, J. 2001. Functional anatomy of execution, mental simulation, observation and verb generation of actions: a meta-analysis. *Human Brain Mapping*, 12, 1–19.

Gries, S. 2009. *Statistics for Linguistics with R: a practical introduction*. Berlin: De Gruyter.

Grishman, R. & Kittredge, R. (eds.) 1986. *Analyzing Language in Restricted Domains: sublanguage description and processing*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Grosz, B. & Ziv, Y. 1998. Centering, global focus, and right-dislocation. In Walker, M., Joshi, A. & Prince, E. (eds.), *Centering Theory in Discourse*. Oxford: Clarendon Press, 293–307.

Grote, B., Lenke, N. & Stede, M. 1997. Ma(r)king concessions in English and German. *Discourse Processes*, 24, 87–117.

Gruber, O. 2001. Effects of domain-specific interference on brain activation associated with verbal working memory task performance. *Cerebral Cortex*, 11(11), 1047–1055.

Gumperz, J. 1982. *Discourse Strategies*. Cambridge University Press.

Hagoort, P. 2005. On Broca, brain, and binding: a new framework. *Trends in Cognitive Sciences*, 9(9), 416–423.

Hajicová, E. & Vrbová, J. 1982. On the role of the hierarchy of activation in the process of natural language understanding. In Horecky, J. (ed.), *Coling 82. Proceedings of the Ninth International Conference on Computational Linguistics*. Prague: Academia, 107–113.

Halliday, M. A. K. 1959. *The Language of the Chinese 'Secret History of the Mongols'*. Oxford: Basil Blackwell.

1963a. The tones of English. *Archivum Linguisticum*, 15, 1–28.

1963b. Intonation in English grammar. *Transactions of the Philological Society*, 143–169.

1964. Syntax and the consumer. In Stuart, C. (ed.), *Report of the Fifteenth Annual (First International) Round Table Meeting on Linguistics and Language Study*. Washington, DC: Georgetown University Press, 11–24.

1966. Some notes on 'deep' grammar. *Journal of Linguistics*, 2(1), 57−67.
1967a. Notes on transitivity and theme in English (I). *Journal of Linguistics*, 3(1), 37–81.
1967b. Notes on transitivity and theme in English (II). *Journal of Linguistics*, 3(2), 199–244.
1969. Options and functions in the English clause. *Brno Studies in English*, 8, 81–88.
1970. Language structure and language function. In J. Lyons (ed.), *New Horizons in Linguistics*. Harmondsworth: Penguin, 140−165.
1973. *Explorations in the Functions of Language*. London: Arnold.
1974. A sociosemiotic perspective on language development. *Bulletin of the School of Oriental and African Studies*, 37(1), 98–118.
1975. *Learning How to Mean: explorations in the development of language*. London: Edward Arnold.
1976a. Early language learning: a sociolinguistic approach. In McCormack, W. & Wurm, S. (eds), *Language and Man: anthropological issues*. Berlin: Mouton de Gruyter, 97–124.
1976b [1966]. The English verbal group. In Kress, G. (ed.), *Halliday: system and function in language. Selected papers*. Oxford University Press, 136–158.
1976c [1961]. Categories of the theory of grammar. In Kress, G. (ed.), *Halliday: system and function in language. Selected papers*. Oxford University Press, 52–72.
1976d [1966]. Some notes on 'deep' grammar. In Kress, G. (ed.), *Halliday: system and function in language. Selected papers*. Oxford University Press, 88–98.
1976e [1969]. A brief sketch of systemic grammar. In Kress, G. (ed.), *Halliday: system and function in language. Selected papers*. Oxford University Press, 3–6.
1977a. Ideas about language. In *Aims and Perspectives in Linguistics. Occasional Papers I*. University of Southern Queensland, Applied Linguistics Association of Australia, Centre for Language Learning and Teaching, 32−49.
1977b. Text as semantic choice in social contexts. In van Dijk, T. & Petöfi, J. (eds.), *Grammars and Descriptions*. Berlin: Walter de Gruyter, 176–225.
1978a. Is learning a second language like learning a first language all over again? In Ingram, D. & Quinn, T. (eds.), *Language Learning in Australian Society: Proceedings of the 1976 Congress of the Applied Linguistics Association of Australia*. Melbourne: Australia International Press and Publications Pty, 3–19.
1978b. *Language as Social Semiotic: the social interpretation of language and meaning*. London: Arnold.
1979a. Modes of meaning and modes of expression: types of grammatical structure and their determination by different semantic functions. In Allerton, D., Carney, E. & Holdcroft, D. (eds.), *Function and Context in Linguistic Analysis: essays offered to William Haas*. Cambridge University Press, 57−79.
1979b. One child's protolanguage. In Bullowa, M. (ed.), *Before Speech: the beginnings of interpersonal communication*. Cambridge University Press, 171−190.
1981. Introduction. In Halliday, M. A. K. & Martin, J. (eds.), *Readings in Systemic Linguistics*. London: Batsford, 13–16.

1984a. On the ineffability of grammatical categories. In Manning, A., Martin, P. & McCall, K. (eds.), *The Tenth LACUS Forum: 1983*. Columbia: Hornbeam, 3–18.
1984b. Language as code and language as behaviour: a systemic-functional interpretation of the nature and ontogenesis of dialogue. In Fawcett, R. P., Halliday, M. A. K., Lamb, S. & Makkai, A. (eds.), *The Semiotics of Culture and Language, Volume 2: language and other semiotic systems of culture*. London: Pinter, 3–35.
1985. *Spoken and Written Language*. Victoria: Deakin University Press.
1991. Corpus studies and probabilistic grammar. In Aijmer, K. & Altenberg, B. (eds.), *English Corpus Linguistics: studies in honour of Jan Svartvik*. London: Longman, 30–43.
1992a. How do you mean? In Davies, M. & Ravelli, L. (eds.), *Advances in Systemic Linguistics: recent theory and practice*. London: Pinter, 20–35.
1992b. A systemic interpretation of Peking syllable finals. In Tench, P. (ed.), *Studies in systemic phonology*. London: Pinter, 98–121.
1994a. *An Introduction to Functional Grammar*, 2nd edn. London: Arnold.
1994b. Systemic theory. In Asher, R. & Simpson, J. (eds.), *The Encyclopedia of Language and Linguistics*. Oxford: Pergamon Press, 4505–4508.
1995a. On language in relation to fuzzy logic and intelligent computing. *Proceedings of 1995 I.E.E.E. International Conference on Fuzzy Systems*. Piscataway: IEEE, 9–26.
1995b. On language in relation to the evolution of human consciousness. In Allén, S. (ed.), *Of Thoughts and Words: proceedings of Nobel Symposium 92 'The relation between language and mind'*, Stockholm, 8–12 August 1994. London: Imperial College Press, 45–84.
1996. On grammar and grammatics. In Hasan, R., Cloran, C. & Butt, D. (eds.), *Functional Descriptions: theory and practice*. Amsterdam: Benjamins, 1–38.
1999. The notion of 'context' in language education. In Ghadessy, M. (ed.), *Text and Context in Functional Linguistics*. Amsterdam: Benjamins, 1–24.
2002a [1961]. Categories of the theory of grammar. In Webster, J. (ed.), *On Grammar*. London: Continuum, 37–94.
2002b [1963]. Class in relation to the axes of chain and choice in language. In Webster, J. (ed.), *On Grammar*. London: Continuum, 95–105.
2002c [1985]. Dimensions of discourse analysis: grammar. In Webster, J. (ed.), *On Grammar*. London: Continuum, 261–286.
2002d [1996]. On grammar and grammatics. In Webster, J. (ed.), *On Grammar*. London: Continuum, 384–417.
2003a [1987]. Language and the order of nature. In Webster, J. (ed.), *On Language and Linguistics*. London: Continuum, 116–138.
2003b [1990]. New ways of meaning: the challenge to applied linguistics. In Webster J. (ed.), *On Language and Linguistics*. London: Continuum, 139–174.
2003c. On the architecture of human language. In Webster, J. (ed.), *On Language and Linguistics*. London: Continuum, 1–29.
2004 [1998]. Things and relations: regrammaticizing experience as technical knowledge. In Webster, J. (ed.), *The Language of Science*. London: Continuum, 49–101.
2005a. Towards probabilistic interpretations. In Webster, J. (ed.), *Computational and Quantitative Studies*. London: Continuum, 42–62.

2005b. Corpus studies and probabilistic grammar. In Webster, J. (ed.), *Computational and Quantitative Studies*. London: Continuum, 63–75.
2005c. Quantitative studies and probabilities in grammar. In Webster, J. (ed.), *Computational and Quantitative Studies*. London: Continuum, 130–156.
2005d. Language as system and language as instance: the corpus as a theoretical construct. In Webster, J. (ed.), *Computational and Quantitative Studies*. London: Continuum, 76–92.
2005e. On matter and meaning: the two realms of human experience. *Linguistics and the Human Sciences*, 1(1), 59–82.
2007a [2002]. Applied linguistics as an evolving theme. In Webster, J. (ed.), *Language and Education*. London: Continuum, 1–19.
2007b. Language and social man. In Webster, J. (ed.), *Language and Society*. London: Continuum, 65–130.
2009. Methods – techniques – problems. In Halliday, M. A. K. & Webster, J. (eds.), *Continuum Companion to Systemic Functional Linguistics*. London: Continuum, 59–86.
2010. Pinpointing the choice: meaning and the search for equivalents in a translated text. In Mahboob, A. & Knight, N. (eds.), *Appliable Linguistics*. London: Continuum, 13–24.
Halliday, M. A. K. & Fawcett, R. P. (eds.) 1987. *New Developments in Systemic Linguistics, Volume 1: theory and description*. London: Pinter.
Halliday, M. A. K. & Greaves, W. 2008. *Intonation in the Grammar of English*. London: Equinox.
Halliday, M. A. K. & Hasan, R. 1976. *Cohesion in English*. London: Longman.
1985. *Language, Context, and Text: aspects of language in a social-semiotic perspective*. Oxford University Press.
Halliday, M. A. K. & James, Z. 2005. A quantitative study of polarity and primary tense in the English finite clause. In Webster, J. (ed.), *Computational and Quantitative Studies, Volume 6.* London: Continuum, 93–129.
Halliday, M. A. K., Lamb, S. & Regan, J. 1988. *In Retrospect: using language and knowing how*. Twelfth in a series of seminars: Issues in Communication, Claremont Graduate School.
Halliday, M. A. K. & Martin, J. (eds.) 1981. *Readings in Systemic Linguistics*. London: Batsford.
1993. *Writing Science: literacy and discursive power*. London: Falmer Press.
Halliday, M. A. K. & Matthiessen, C. 1999. *Construing Experience through Meaning: a language-based approach to cognition*. London: Continuum.
2004. *An Introduction to Functional Grammar*, 3rd edn. London: Arnold.
Halliday, M. A. K., McIntosh, A. & Strevens, P. 1964. *The Linguistic Sciences and Language Teaching*. London: Longman.
Halliday, M. A. K. & Webster, J. (eds.) 2009b. *Continuum Companion to Systemic Functional Linguistics*. London: Continuum.
Hannay, M. 1985. *English Existentials in Functional Grammar*. Dordrecht: Foris.
Harder, P. 1996. *Functional Semantics: a theory of meaning, structure and tense in English*. Berlin: Mouton de Gruyter.
Harré, R. & Langenhove, L. (eds.) 1999. *Positioning Theory*. Oxford: Blackwell.
Harris, M. & Vincent, N. 1980. On zero relatives. *Linguistic Inquiry*, 11, 805–807.

Harris, Z., Gottfried, M., Ryckman, T., Mattick, P., Daladier, A., Harris, T. & Harris, S. 1989. *The Form of Information in Science: analysis of an immunology sublanguage*. Dordrecht: Kluwer Academic Publishers.

Hasan, R. 1973. Code, register and social dialect. In Bernstein, B. (ed.), *Class, Codes and Control*, vol. 2. London: Routledge and Kegan Paul, 253–293.

1978. Text in the systemic-functional model. In Dressler, W. (ed.), *Current Trends in Text Linguistics*. Berlin: Walter de Gruyter, 228–246.

1981. What's going on: a dynamic view of context in language. In Copeland, J. & Davis, P. (eds.), *The Seventh LACUS Forum*. Columbia: Hornbeam Press, 106–121.

1983. A semantic network for the analysis of messages in everyday talk between mothers and their children. Mimeo, Macquarie University, Sydney.

1984. Coherence and cohesive harmony. In Flood, J. (ed.), *Understanding Reading Comprehension: cognition, language and the structure of prose*. Delaware: International Reading Association, 181–219.

1985a. Lending and borrowing: from grammar to lexis. In Clark, J. (ed.), *The Cultivated Australian: festschrift presented to Arthur Delbridge*. Amsterdam: Helmut Buske, 55–67.

1985b. *Linguistics, Language and Verbal Art*. Geelong: Deakin University Press.

1987. The grammarian's dream: lexis as most delicate grammar. In Halliday, M. A. K. & Fawcett, R. P. (eds.), *New Developments in Systemic Linguistics, Volume 1: theory and description*. London: Pinter, 184–211.

1992. Meaning in sociolinguistic theory. In Bolton, K. & Kwok, H. (eds.), *Sociolinguistics Today: international perspectives*. London: Routledge & Kegan Paul, 80–119.

1995. The conception of context in text. In Fries, P. & Gregory, M. (eds.), *Discourse in Society: Systemic Functional perspectives: meaning and choice in language: studies for Michael Halliday*. Norwood: Ablex, 183–283.

1996a. On teaching literature across cultural distances. In James, J. (ed.), *The Language-Culture Connection*. Singapore: SEAMEO Regional Language Centre, 34–63.

1996b. Semantic networks: a tool for the analysis of meaning. In Cloran, C., Butt, D. & Williams, G. (eds), *Ways of Saying, Ways of Meaning: selected papers of Ruqaiya Hasan*. London: Cassell, 104–131.

1996c [1984]. The nursery tale as genre. In Cloran, C., Butt, D. & Williams, G. (eds.), *Ways of Saying: Ways of Meaning. Selected papers of Ruqaiya Hasan*. London: Cassell, 51–72.

1996d [1980]. What's going on: a dynamic view of context in language. In Cloran, C., Butt, D. & Williams, G. (eds.), *Ways of Saying, Ways of Meaning: selected papers of Ruqaiya Hasan*. London: Cassell, 37–50.

1999. Speaking with reference to context. In Ghadessy, M. (ed.), *Text and Context in Functional Linguistics*. Amsterdam: Benjamins, 219–328.

2000. The uses of talk. In Sarangi, S. & Coulthard, M. (eds.), *Discourse and Social Life*. London: Longman, 28–47.

2004. Analysing discursive variation. In Young, L. & Harrison, C. (eds.), *Systemic Functional Linguistics and Critical Discourse Analysis: studies in social change*. London: Continuum, 15–52.

2009a. *Semantic Variation: meaning in society and in sociolinguistics, the collected works of Ruqaiya Hasan, vol. 2*, ed. Webster, J. London: Equinox.

2009b. Wanted: an integrated theory for sociolinguistics. In Webster, J. (ed.), *Semantic Variation: meaning in society and in sociolinguistics, the collected works of Ruqaiya Hasan, vol. 2*. London: Equinox, 5−40.
2009c. The place of context in a Systemic Functional Model. In Halliday, M. A. K. & Webster, J. (eds.), *Continuum Companion to Systemic Functional Linguistics*. London: Continuum, 166–189.
2010. The meaning of 'not' is not in 'not'. In Mahboob, A. & Knight, N. (eds.), *Appliable Linguistics*. London: Continuum, 267−306.
2011. English process, English tense: foreigner learner, foreign teacher. In Webster, J. (ed.), *The Collected Works of Ruqaiya Hasan, Volume 3: Language and Education: Learning and Teaching in Society*. London: Equinox, 336−379.
2012. A view of pragmatics in a social semiotic perspective. *Linguistics and the Human Sciences*, 5(3), 251–279.
2013. Linguistic sign and the science of linguistics. In Fang, Y. & Webster, J. (eds.), *Developing Systemic Functional Linguistics: theory and applications*. London: Equinox.
Hasan, R. & Cloran, C. 1990. A sociolinguistic interpretation of everyday talk between mothers and children. In Halliday, M. A. K., Gibbons, J. & Nicholas, H. (eds.), *Learning, Keeping and Using Language. Volume 1: Selected Papers from the 8th World Congress of Applied Linguistics*, Sydney, 16–21 August 1987. Amsterdam: Benjamins, 67–99.
Hasan, R., Cloran, C., Williams, G. & Lukin, A. 2007. Semantic networks: the description of linguistic meaning in SFL. In Hasan, R., Matthiessen, C. & Webster, J. (eds.), *Continuing Discourse on Language: a functional perspective*, vol. 2. London: Equinox, 697–738.
Hasan, R. & Fries, P. 1995. Reflections on subject and theme. In Hasan, R. & Fries, P. (eds.), *On Subject and Theme: a discourse functional perspective*. Amsterdam: Benjamins, xiii−xlv.
Hasan, R. & Martin, J. 1989. (eds.) *Language Development: learning language, learning culture.* New Jersey: Ablex.
Hasan, R., Matthiessen, C. & Webster, J. (eds.) 2005. *Continuing Discourse on Language: a functional perspective*, vol. 1. London: Equinox.
(eds.) 2007. *Continuing Discourse on Language: a functional perspective*, vol. 2. London: Equinox.
Henderson, E. 1951. The phonology of loanwords in some South-East Asian languages. *Transactions of the Philological Society*, 131–158.
Henrici, A. 1981 [1966]. Some notes on the systemic generation of a paradigm of the English clause. In Halliday, M. A. K. & Martin, J. (eds.), *Readings in Systemic Linguistics*. London: Batsford Academic.
Henschel, R., Bateman, J. & Delin, J. 2002. Automatic genre-driven layout generation. In *Proceedings of the 6th Konferenz zur Verarbeitung natürlicher Sprache (KONVENS 2002)*. University of the Saarland, Saarbrücken, 51–58.
Hill, T. 1966. The technique of prosodic analysis. In Bazell, C., Catford, J., Halliday, M. A. K. & Robins, R. (eds.), *In Memory of J. R. Firth*. London: Longman, 198–226.
Hjelmslev, L. 1953 [1942]. *Prolegomena to a Theory of Language,* trans. Whitfield, F. Bloomington: Indiana University Press.
Hjelmslev, L. 1961 [1943]. *Prolegomena to a Theory of Language.* Madison: University of Wisconsin Press.

Hjelmslev, L. 1969 [1961]. *Prolegomena to a Theory of Language*, trans. Whitfield, F. Madison: University of Wisconsin Press.
Hjelmslev, L. 1993 [1943]. *Omkring Sprogteoriens Grundlæggelse* (Travaux du Cercle Linguistique de Copenhague XXV. Med et essay af Francis J. Whitfield). Copenhagen: The Linguistic Circle of Copenhagen.
Hlavacka, L. 2004. Patrones de transitividad en la sección Anuncio de la Investigación del Abstract del artículo de investigación científica en inglés. Tesis de maestría, Universidad Nacional de Cuyo, Mendoza, Argentina.
Hockett, C. F. 1961. Linguistic elements and their relations. *Language*, 27, 29–53.
Hoey, M. 2005. *Lexical Priming.* Abingdon: Routledge.
Hoffmeyer, J. 2010a. Semiotic freedom: an emerging force. In Davies, P. & Gregersen, N. (eds.), *Information and the Nature of Reality: from physics to metaphysics*. Cambridge University Press, 185−204.
2010b. The semiotics of nature: code-duality. In Favareau, D. (ed.), *Essential Readings in Biosemiotics: anthology and commentary*. New York: Springer, 587−628.
Holland, R. & Lambon-Ralph, M. 2010. The anterior temporal lobe semantic hub is a part of the language neural network: selective disruption of irregular past tense verbs by rTMS. *Cerebral Cortex*, 20, 2771–2775.
Holmback, H. 1984. An interpretative solution to the definiteness effect problem. *Linguistic Analysis*, 13, 195–215.
Holtz, M. 2011. Lexico-grammatical properties of abstracts and research articles. A corpus-based study of scientific discourse from multiple disciplines. Unpublished PhD thesis, TU Darmstadt, Germany.
Hopper, P. & Closs Traugott, E. 1993. *Grammaticalization*. Cambridge University Press.
Horrocks, G. 1997. *Greek: a history of the language and its speakers*. London: Longman.
Hubbard, R. & Wald, E. 1999. *Exploding the Gene Myth*. Boston: Beacon Press.
Hubel, D. & Wiesel, T. 1962. Receptive fields, binocular interaction and functional architecture in the cat's visual cortex. *Journal of Physiology*, 160, 106–154.
1968. Receptive fields and functional architecture of monkey striate cortex. *Journal of Physiology*, 195, 215–243.
1977. Functional architecture of macaque monkey cortex. *Proceedings of the Royal Society of London*, 198, 1–59.
Huddleston, R. & Pullum, G. 2002. *The Cambridge Grammar of the English Language*. Cambridge University Press.
Hunston, S. 2003. Lexis, wordform and complementation pattern: a corpus study. *Functions of Language*, 10(1), 31–60.
2004. Counting the uncountable: problems of identifying evaluation in a text and in a corpus. In Partington, A., Morley, J. & Haarman, L. (eds.), *Corpora and Discourse*. Bern: Peter Lang, 157–188.
Hunston, S. & Francis, G. 2002. *Pattern Grammar*. Amsterdam: Benjamins.
Hunston, S. & Thompson, G. (eds.) 2003. *Evaluation in Text: authorial stance and the construction of discourse*. Oxford University Press.
Hurewitz, F. 1998 A quantitative look at discourse coherence. In Walker, A. & Prince, E. (eds.), *Centering Theory in Discourse*. Oxford: Clarendon Press, 273–291.
Hymes, D. 1996. *Ethnography, Linguistics, Narrative Inequality: towards an understanding of voice*. London: Taylor and Francis.

Iaccoboni, M., Woods, R., Brass, M., Bekkering, H., Mazziotta, J. & Rizzolatti, G. 1999. Cortical mechanisms of human imitation. *Science*, 286(5449), 2526–2528.

Indefrey, P. & Levelt, W. J. M. 2000. The neural correlates of language production. In Gazzinga, M. (ed.), *The New Cognitive Neurosciences*. Cambridge, MA: MIT Press, 845−865.

2004. The spatial and temporal signatures of word production components. *Cognition*, 92, 101−144.

Ivie, R. & Giner, O. 2009. More good, less evil: contesting the mythos of national insecurity in the 2008 Presidential Primaries. *Rhetoric & Public Affairs*, 12(2), 279–301.

Jackendoff, R. 1990. *Semantic Structures.* Cambridge, MA: MIT Press.

Jakobson, R. 1960. Closing statement: linguistics and poetics. In Sebeok, T. (ed.), *Style in Language*. Cambridge, MA: MIT Press, 350–377.

1973. *Main Trends in the Science of Language*. London: George Allen and Unwin.

Jenkins, L. 1975. *The English Existential*. Tübingen: Max Niemeyer Verlag.

Johansson, S. 1978. *Manual of Information to Accompany the Lancaster-Oslo/Bergen Corpus of British English, for Use with Digital Computers*. University of Oslo (Department of English).

John Fairfax & Sons 1931. *A Century of Journalism: the* Sydney Morning Herald *and its record of Australian life, 1831–1931*. Sydney: John Fairfax & Sons Limited.

Johns, C., Tooley, K. & Traxler, M. 2008. Discourse impairments following right hemisphere damage: a critical review. *Language and Linguistics Compass*, 2(6), 1038–1062.

Johnston, T. 1989. *Auslan Dictionary: a dictionary of the sign language of the Australian deaf community*. Sydney: Deafness Resources Australia.

1994. Sign languages in Australasia. In Asher, R. E. (ed.), *The Encyclopedia of Language and Linguistics,* vol. 7. Oxford: Pergamon Press, 3922–3923.

Johnston, T. & Schembri, A. 2007. *Australian Sign Language: an introduction to sign language linguistics*. Cambridge University Press.

Johnstone, S. 1999. *Disputes and Democracy: the consequences of litigation in ancient Athens*. Austin: University of Texas Press.

Joseph, B. & Janda, R. 2003. On language, change, and language change – or, of history, linguistics, and historical linguistics. In Joseph, B. & Janda, R. (eds.), *The Handbook of Historical Linguistics*. Oxford & Malden, MA: Blackwell, 3–180.

Kaas, J., Nelson, R., Sur, M. & Merzenich, M. 1981. Organization of somatosensory cortex in primates. In Schmitt, F., Worden, F., Adelman, G. & Dennis, S. (eds.), *The Organization of the Cerebral Monkey*. Cambridge, MA: MIT Press, 237–261.

Kandhadai, P. & Federmeier, K. 2010. Hemispheric differences in the recruitment of semantic processing mechanisms. *Neuropsychologia*, 48, 3772–3781.

Kappagoda, A. 2009. *The Use of Systemic Functional Linguistics in Automated Text Mining*. Edinburgh, South Australia: Defence Science and Technology Organisation, Department of Defence, Australian Government.

King, A., Linke, J., Gass, A., Hennerici, M., Tost, H., Poupon, C. & Wessa, M. 2012. Microstructure of a three-way anatomical network predicts individual difference in response inhibition: a tractography study. *NeuroImage*, 59(2), 1949–1959.

Kipfer, B. A. & Roget, P. M. 1992 [1851]. *Roget's 21st Century Thesaurus in Dictionary Form*. New York: Dell Pub.

Kittredge, R. & Lehrberger, L. (eds.) 1982. *Sublanguage: studies of language in restricted semantic domains*. Berlin: de Gruyter.

Krauss, S. & Wang, X. 2003. The psychology of the Monty Hall Problem: discovering psychological mechanisms for solving a tenacious brain teaser. *Journal of Experimental Psychology General*, 132, 3–22.

Krawcyzk, D. 2002 Contributions of the prefrontal cortex to the neural basis of human decision making. *Neuroscience and Behavioural Reviews*, 26, 631–664.

Kress, G. 2010: *Multimodality: a social semiotic approach to contemporary communication*. London: Routledge.

Kress, G. & van Leeuwen, T. 2006. *The Grammar of Visual Design*. London: Routledge.

Kringelbach, M. & Rolls, E. 2004. The functional neuroanatomy of the human orbitofrontal cortex: evidence from neuroimaging and neuropsychology. *Progress in Neurobiology*, 72, 341–372.

Kuno, S. & Takami, Ken-Ichi 2004. *Functional Constraints in Grammar: on the unergative−unaccusative distinction*. Amsterdam: Benjamins.

Kuperberg, G., Lakshmanan, B., Caplan, D. & Holcomb, P. 2006. Making sense of discourse: an fMRI study of causal inferencing across sentences. *NeuroImage*, 33, 343–361.

Kytö, M. 1996. *Manual to the Diachronic Part of the Helsinki Corpus of English Texts: coding conventions and lists of source texts*. University of Helsinki.

Labov, W. 1972. *Sociolinguistic Patterns*. Oxford: Basil Blackwell.

Labov, W. & Waletzky, J. 1967. Narrative analysis, in Helm, J. (ed.), *Essays on the Verbal and Visual Arts*. Seattle: University of Washington Press, 12–44.

Lakoff, G. 2002. *Moral Politics: How liberals and conservatives think*. University of Chicago Press.

Lamb, S. 1964. The sememic approach to structural semantics. *American Anthropologist*, 66(3,2), 57–78.

1966. *Outline of Stratificational Grammar*. Washington, DC: Georgetown University Press.

1971. The crooked path of progress in cognitive linguistics (Georgetown University Monograph Series on Languages and Linguistics, 24). Washington, DC: Georgetown University Press, 99–123.

1999. *Pathways of the Brain: the neurocognitive basis of language*. Amsterdam: Benjamins.

2002. Interpreting discourse. In Fries, P., Cummings, M., Lockwood, S. & Spruiell, W. (eds.), *Relations and Functions within and around Language*. London: Continuum, 256−276.

2004a. Dimensions of the territory of neurolinguistics. In Webster, J. (ed.), *Language and Reality: selected writings of Sydney Lamb*. London: Continuum, 318–323.

2004b. What is a language? In Webster, J. (ed.), *Language and Reality: selected writings of Sydney Lamb*. London: Continuum, 394–414.

2004c. Semiotics and human knowledge. In Webster, J. (ed.), *Language and Reality: selected writings of Sydney Lamb*. London: Continuum, 425–443.

2004d. Language as a network of relationships. In Webster, J. (ed.), *Language and Reality: selected writings of Sydney Lamb*. London: Continuum, 133–175.

2004e. Linguistics to the beat of a different drummer. In Webster, J. (ed.), *Language and Reality: selected writings of Sydney Lamb*. London: Continuum, 12–44.
2005. Language and brain: when experiments are unfeasible, you have to think harder. *Linguistics and the Human Sciences*, 1, 151–178.
2006. Being realistic, being scientific. In Hwang, S., Sullivan, W. & Lommel, A. (eds.), *LACUS Forum 32: networks*, 201–209.
2010. Systemic networks, relational networks, and neural networks. Paper presented at the City University of Hong Kong, 1 November 2010.
Lass, R. 1997. *Historical Linguistics and Language Change*. Cambridge University Press.
Leakey, R. 1994. *The Origins of Humankind*. London: Phoenix.
Leckie-Tarry, H. 1995. *Language and Context: a functional linguistic theory of register* (ed. David Birch). London: Pinter.
Leech, G. & Svartvik, J. 1975. *A Communicative Grammar of English*. London: Longman.
Leggett, A. 2008. Realism and the physical world. *Reports on Progress in Physics*, 71, 1−6.
Leijten, M. & Van Waes, L. 2006. Inputlog: new perspectives on the logging of online writing. In Sullivan, K. & Lindgren, E. (eds.), *Computer Key-stroke Logging and Writing: methods and applications* (Studies in Writing, 18). Oxford: Elsevier, 73–94.
Lemke, J. 1990. Technical discourse and technocratic ideology. In Halliday, M. A. K., Gibbons, J. & Nicholas, H. (eds.), *Learning, Keeping and Using Language: selected papers from the 8th AILA World Congress of Applied Linguistics*, vol. II. Amsterdam: Benjamins, 435–460.
1993. Discourse, dynamics, and social change. *Cultural Dynamics*, 6(1–2), 243–276.
1995. *Textual Politics: discourse and social dynamics*. London: Taylor and Francis.
1998. Resources for attitudinal meaning; evaluative orientations in text semantics. *Functions of Language*, 5(1), 33–56.
León-Carrión, J., Issetoglu, M., Izzetoglu, K., Martin-Rodríguez, J., Barroso y Martin, D.-L. & Domínguez-Morales, M. 2010. Efficient learning produces spontaneous neural repetition suppression in prefrontal cortex. *Behavioural Brain Research*, 208, 502–508.
Levelt, W. J. M. 1989. *Speaking: from intention to articulation*. Cambridge, MA: MIT Press.
1999. Models of word production. *Trends in Cognitive Sciences*, 3, 223−232.
Lewontin, R. 1993. *Biology as Ideology: the doctrine of DNA*. London: Penguin.
2000a. *The Triple Helix: gene, organism and environment*. Cambridge, MA: Harvard University Press.
2000b. *It Ain't Necessarily So: the dream of the human genome and other illusions*. London: Granta Books.
Libet, B., Gleason, C., Wright, E. & Pearl, D. 1983. Time of conscious intention to act in relation to onset of cerebral activities (readiness-potential): the unconscious initiation of a freely voluntary act. *Brain*, 106, 623–642.
Liddell, H., Scott, R., Jones, H., McKenzie, R. & Barber, E. 1968. *A Greek−English lexicon*. Oxford: Clarendon Press.

Lieberman, P. 2000. *Human Language and Our Reptilian Brain: the subcortical bases of speech, syntax and thought*. Cambridge, MA: Harvard University Press.

Lounsbury, F. 1956. A semantic analysis of the Pawnee kinship usage. *Language*, 32, 158–194.

Luraghi, S. 2005. *Ancient Greek*. Munchen: Lincom Europa.

Mair, C. 2006. *Twentieth-Century English: history, variation and standardization*. Cambridge University Press.

Mair, C. & Leech, G. 2006. Current change in English syntax. In Aarts, B. & MacMahon, A. (eds.), *The Handbook of English Linguistics*. Oxford: Blackwell, 318−342.

Mann, W. 1985. An introduction to the Nigel text generation grammar. In Benson, J. & Greaves, W. (eds.), *Systemic Perspectives on Discourse*, vol. 1. Norwood: Ablex, 84−95.

Mann, W. & Matthiessen, C. 1985 [1983]. A demonstration of the Nigel text generation computer program. In Benson, J. & Greaves, W. (eds.), *Systemic Perspectives on Discourse*, vol. 1. Norwood: Ablex, 50–83.

Mann, W., Matthiessen, C. & Thompson, S. 1992. Rhetorical Structure Theory and text analysis, In Mann, W. & Thompson, S. (eds.), *Discourse Description: diverse linguistic analyses of a fund-raising text*. Amsterdam: Benjamins, 39–78.

Mann, W. & Thompson, S. 1988. Rhetorical Structure Theory: toward a functional theory of text organization. *Text*, 8(3), 243–281.

Manning, C. 2003. Probabilistic syntax. In Bod, R., Hay, J. & Jannedy, S. (eds.), *Probabilistic Linguistics.* Cambridge, MA: MIT Press, 289–341.

Manning C. & Schütze, H. 1999. *Foundations of Statistical Natural Language Processing*. Cambridge, MA: MIT Press.

Marcu, D. 2000. The rhetorical parsing of unrestricted texts: a surface-based approach. *Computational Linguistics*, 26(3), 395–448.

Margulis, L. 1998. *Symbiotic Planet: a new view of evolution*. New York: Basic Books.

2001. The conscious cell. *Annals of the New York Academy of Sciences*, 929(1), 55–70.

Martin, J. 1985. Process and text: two aspects of human semiosis. In Benson, J. & Greaves, W. (eds.), *Systemic Perspectives on Discourse*, vol. 1. Norwood: Ablex, 248–274.

1987. The meaning of features in systemic linguistics. In Halliday, M. A. K. & Fawcett, R. P. (eds.), *New Developments in Systemic Linguistics. Volume 1: theory and description*. London: Pinter, 14–40.

1992. *English Text: system and structure*. Amsterdam: Benjamins.

1999. Modelling context: a crooked path of progress in contextual linguistics. In Ghadessy, M. (ed.), *Text and Context in Functional Linguistics*. Amsterdam: Benjamins, 25−61.

2000. Beyond exchange: APPRAISAL systems in English. In Hunston, S. & Thompson, G. (eds.), *Evaluation in Text*. Oxford University Press, 142–175.

2004. Positive discourse analysis: power, solidarity and change. *Revista Canaria de Estudios Ingleses*, 49, 179−200.

2009. Genre and language learning: a social semiotic perspective. *Linguistics and Education*, 20, 10−21.

2010. Semantic variation – modelling realisation, instantiation and individuation in social semiosis. In Bednarek, M. & Martin, J. (eds.), *New Discourse on Language: functional perspectives on multimodality, identity, and affiliation*. London: Continuum, 1–34.

Martin, J. & Hasan, R. (eds.) 1989. *Language Development: learning language, learning culture*. Norwood: Ablex.

Martin, J. & Matthiessen, C. 1991. Systemic typology and topology. In Christie, F. (ed.), *Papers from the Inaugural Australian Systemic Linguistics Conference*, January 1990. Darwin: Northern Territory University, Centre for Studies of Language in Education, 345−383.

Martin, J. and Rose, D. 2003. *Working with Discourse: meaning beyond the clause*. London: Continuum.

Martin, J. & White, P. 2005. *The Language of Evaluation: appraisal in English*. New York: Palgrave Macmillan.

Martinec, R. & Salway, A. 2005. A system for image-text relations in new (and old) media. *Visual Communication*, 4, 337–371.

Martínez-Insua, A. 2004. *Existential* there-*constructions in Contemporary British English: a corpus-driven analysis of their use in speech and writing*. München: Lincom Europa.

2011. When discourse matches syntax: on Meta-Informative Centering Theory and Discourse Coherence in the recent history of English. *International Journal of English Studies*, 11(2), 97−117.

Martínez-Insua, A. & Pérez-Guerra, J. 2006. 'There's Björg': on *there*-sentences in the recent history of English. In Breivik, L., Halverson, S. & Haughland, K. (eds.), '*These things write I vnto thee . . . '. Essays in Honour of Björg Baekken*. Oslo: Novus Press, 189–211.

Mathesius, V. 1937. O tak zvanem aktualnim clelneni vetnem [On the so-called actual bipartition of the sentence]. *Slovo a Slovcesnost*, 5, 171–174.

Matheson, D. 2000. The birth of news discourse: changes in news language in British newspapers, 1880–1930. *Media, Culture and Society*, 22(5), 557–573.

Matsuhashi, A. 1982. Explorations in the real-time production of written discourse. In Nystrand, M. (ed.), *What Writers Know*. New York: Academic Press, 269–290.

Matthiessen, C. 1985. The systemic framework in text generation: Nigel. In Benson, J. & Greaves, W. (eds.), *Systemic Perspectives on Discourse*, vol. 1. Norwood: Ablex.

1988. Semantics for a systemic grammar: the chooser and inquiry framework. In Benson, J., Cummings, M. & Greaves, W. (eds.), *Linguistics in a Systemic Perspective*. Amsterdam: Benjamins, 221–242.

1991. Language on language: the grammar of semiosis. *Social Semiotics*, 1(2), 69–111.

1993. Register in the round: diversity in a unified theory of register analysis. In Ghadessy, M. (ed.), *Register Analysis: theory and practice*. London: Pinter, 221–291.

1995. *Lexico-grammatical Cartography: English systems.* Tokyo: International Language Sciences Publishers.

1999. The system of transitivity: an exploratory study of text-based profiles. *Functions of Language*, 6(1), 1–51.

2006. Frequency profiles of some basic grammatical systems: an interim report. In Thompson, G. & Hunston, S. (eds.), *System and Corpus: exploring connections*. London: Equinox, 103–142.
2007. The 'architecture' of language according to systemic functional theory: developments since the 1970s. In Hasan, R., Matthiessen, C. & Webster, J. (eds.), *Continuing Discourse on Language: a functional perspective*, vol. 2. London: Equinox, 505–561.
2009. Ideas and new directions. In Halliday, M. A. K. & Webster, J. (eds.), *Continuum Companion to Systemic Functional Linguistics*. London: Continuum, 12–58.
2010. Multisemiotic and context-based register typology: registerial variation in the complementarity of semiotic systems. In Ventola, E. & Moya Guijarra, A. (eds.), *The World Shown and the World Told*. New York: Palgrave Macmillan, 11−38.
2011. Register and context symposium: question – some thoughts. Unpublished draft document presented for discussion at the Symposium on Register and Context, Macquarie University, February, 2011.
2012. Tenor. Plenary presented at the Symposium on Register and Context: Social Context and the Enactment of Tenor, convenors A. Lukin & A. Moore, 6−8 February 2012, Macquarie University, Sydney.
Matthiessen, C. & Bateman, J. 1991. *Text Generation and Systemic-Functional Linguistics: experiences from English and Japanese*. London: Pinter.
Matthiessen, C., Teruya, K. & Lam, M. 2010. *Key Terms in Systemic Functional Linguistics*. London: Continuum.
Mauranen, A. 2001. Academic speech corpora: small and special. Unpublished plenary paper given at *Academic Discourse: Small Corpora and Genre Analysis* conference, 6–7 December 2001, Modena, Italy.
McDonald, E. 2005. Through a glass darkly: a critique of the influence of linguistics on theories of music. *Linguistics and the Human Sciences*, 1(3), 463−488.
McGeough, P. 2003. *In Baghdad: a reporter's war*. Crows Nest, NSW: Allen & Unwin.
Meares, R. 2005. *The Metaphor of Play: origin and breakdown of personal being*, 3rd edn. London: Routledge.
Meechan, M. & Foley, M. 1994. On resolving disagreement: linguistic theory and variation – there's bridges. *Language Variation and Change*, 6, 63–85.
Melrose, R. 2005. How a neurological account of language can be reconciled with a linguist's account of language: the case of systemic-functional linguistics. *Journal of Neurolinguistics*, 18, 401–421.
Mesulam, M. 1998. From sensation to cognition, *Brain*, 121(6), 1013–1052.
2000. *Principles of Behavioural and Cognitive Neurology*. Oxford University Press.
2002. The human frontal lobes: transcending the default mode through contingent encoding. In Stuss, D. & Knight, R. (eds.), *The Principles of Frontal Lobe Function*. Oxford University Press, 8–30.
Meurer, J. 1998. *Aspects of Language in Self-help Counseling*. Arroio Trinta: ARES.
Mierswa, I., Wurst, M., Klinkenberg, R., Scholz, M. & Euler, T. 2006. YALE: rapid prototyping for complex data mining tasks. In Ungar, L., Craven, M., Gunopulos, D. &

Eliassi-Rad, T. (eds.), *Proceedings of KDD '06, 12th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*. Philadelphia: SIGKDD, 935–940.

Miller, D. R. 1999. Meaning up for grabs: value-orientation patterns in British parliamentary debate on Europe. In Verschueren, J. (ed.), *Language and Ideology: selected papers from the 6th International Pragmatics Conference*, vol. I. Antwerp: International Pragmatics Association, 386–404.

2000. On computing appraisal in a corpus of parliamentary debate, or, ticklish trawling. Unpublished paper delivered to the Systemic Functional Linguistics European Workshop, 19–22 July, Glasgow.

2002a. Ways of meaning 'yea' and 'nay' in parliamentary debate as register: a cost-benefit analysis. In Bignami, M., Iamartino, G. & Pagetti, C. (eds.), *The Economy Principle in English: linguistic, literary, and cultural perspectives. Selected Proceedings of the 19th Conference of the Associazione Italiana di Anglistica*. Milano: Edizioni Unicopli, 220–233.

2002b. Multiple judicial opinions as specialized sites of engagement: conflicting paradigms of valuation and legitimation in Bush v. Gore 2000. In Gotti, M., Heller, D. & Dossena, M. (eds.), *Conflict and Negotiation in Specialized Texts*. Bern: Peter Lang, 119–141.

2004. 'Truth, justice and the American way': the APPRAISAL SYSTEM of JUDGEMENT in the U.S. House debate on the impeachment of the President, 1998. In P. Bayley (ed.), *Cross-cultural Perspectives on Parliamentary Discourse*. Amsterdam: Benjamins, 271–300.

2006a. Foreword. In Freddi, M., *Functional Grammar: an introduction for the EFL student*. Bologna: Clueb, i–iv.

2006b. From concordance to text: appraising 'giving' in Alma Mater donation requests. In Thompson, G. & Hunston, S. (eds.), *System and Corpus: exploring connections*. London: Equinox, 248–268.

2007. Towards a typology of evaluation in parliamentary debate: from theory to practice – and back again. In Dossena, M. & Jucker, A. (eds.), (R)evolutions in evaluation, *Textus* 20(1), 159–180.

Miller, D. R. & Johnson, J. H. 2009. Evaluation, speaker–hearer positioning and the Iraq war: a corpus-assisted study of Congressional argument. In Morley J. & Bayley, P. (eds.), *Corpus Assisted Discourse Studies on the Iraq Conflict: wording the war*. London: Routledge, 34–73.

(forthcoming). Evaluative phraseological choice and speaker party/gender: a corpus-assisted comparative study of 'register-idiosyncratic' meaning in Congressional debate. In Thompson G. & Alba, L. (eds.), *Evaluation in Context*. Amsterdam: Benjamins.

Milsark, G. 1976. *Existential Sentences in English*. Bloomington: Indiana University Linguistics Club.

Mitchell, T. 1957. The language of buying and selling in Cyrenaica. *Hesperis*, 44, 31–71.

Mithun, M. 2004. Functional perspectives on syntactic change. In Joseph, B. & Janda, R. (eds.), *The Handbook of Historical Linguistics*. Oxford & Malden, MA: Blackwell, 552–572.

Moita Lopes, L. P. da 1996. *Oficina de Lingüística Aplicada: a natureza social e educacional dos processos de ensino/aprendizagem de línguas*. Campinas: Mercado de Letras.

Morley, J. 2004. The sting in the tail: persuasion in English editorial discourse. In Partington, A., Morley, J. & Haarman, L. (eds.), *Corpora and Discourse*. Bern: Peter Lang, 239–255.

Mountcastle, V. 1997. The columnar organization of the neocortex. *Brain*, 120, 701–722.

1998. *Perceptual Neuroscience: the cerebral cortex*. Cambridge, MA: Harvard University Press.

Mufwene, S. 2001. *The Ecology of Language Evolution*. Cambridge University Press.

Murphy, A. 2009. Editorials and opinion articles in the CorDis corpus. In Morley J. and Bayley, P. (eds.), *Corpus Assisted Discourse Studies on the Iraq Conflict: wording the war.* London: Routledge, 186–207.

Murray, D. 1972. Teach writing as a process not product. *The Leaflet*, November 1972, 11–14.

Nanard, M., Nanard, J., King, P. & Gaillard, L. 2007. Genre driven multimedia document production by means of incremental transformation. In King, P. & Simske, S. (eds.), *DocEng '07: Proceedings of the 2007 ACM Symposium on Document Engineering*. New York: ACM Press.

Neale, A. 2002. *The Process Type Data Base.* Available online: <http://www.itri.bton.ac.uk/~Amy.Neale/> (last accessed 2 July 2012).

Nesbitt, C. & Plum, G. 1988. Probabilities in a systemic grammar: the clause complex in English. In Fawcett, R. P. & Young, D. (eds.), *New Developments in Systemic Linguistics, Vol. 2: theory and application*. London: Frances Pinter, 6−38.

Neumann, S. 2009. Contrastive register variation: a quantitative approach to the comparison of English and German. Unpublished postdoctoral thesis, Universität des Saarlandes, Saarbrücken, Germany.

Nieuwland, M., Petersson, K. & van Berkum, J. 2007. On sense and reference: examining the functional neuroanatomy of referential processing. *NeuroImage*, 37, 993–1004.

Norman, D. & Shallice, T. 2000 [1986]. Attention to action: willed and automatic control of behaviour. In Gazaniga, M. S. (ed.), *Cognitive Neuroscience: a reader*. Oxford: Blackwell, 376–390.

O'Donnell, M. 1990. A dynamic model of exchange. *Word*, 41(3), 293–328.

1999. Context in dynamic modelling. In Ghadessy, M. (ed.), *Text And Context In Functional Linguistics*. Amsterdam: Benjamins, 63–99.

2000. Intermixing multiple discourse strategies for automatic text composition. *Revista Canaria de Estudios Ingleses* (RCEI), 40, April, 115–133.

2010. UAM CorpusTool Manual v2.6 (PDF). Available online: <http://www.wagsoft.com/CorpusTool/documentation.html> (last accessed 23 January 2011).

O'Donnell, M. & Bateman, J. 2007. SFL in computational contexts: a contemporary history. In Hasan, R., Matthiessen, C. & Webster, J. (eds.). *Continuing Discourse on Language: a functional perspective*, vol. 2. London: Equinox, 343–382.

O'Donnell, M., Cheng, H. & Hitzeman, J. 1998. Integrating referring and informing in NP planning. In *Proceedings of the Coling-ACL '98 Workshop on the Computational Treatment of Nominals*. 16 August 1998, Université de Montreal, Canada. Association for Computational Linguistics, 46–55.

O'Donnell, M., Mellish, C., Oberlander, J. & Knott, A. 2001. ILEX: an architecture for a dynamic hypertext generation system. *Natural Language Engineering*, 7, 225–250.

O'Halloran, K. 2011. The semantic hyperspace: accumulating mathematical knowledge across semiotic resources and modalities. In Christie, F. & Maton, K. (eds.), *Disciplinarity: functional linguistic and sociological perspectives*. London: Continuum, 217–236.

Olsen, I., Plotzker, A. & Ezzyat, Y. 2007. The enigmatic temporal poles: a review of findings on social and emotional processing. *Brain*, 130, 1718–1731.

O'Toole, M. 2010 [1994]. *The Language of Displayed Art*. London: Routledge.

Özdemir, R., Roelofs, A. & Levelt, W. 2007. Perceptual uniqueness point effects in monitoring internal speech. *Cognition*, 105, 457–465.

Pacherie, E. 2008. The phenomenology of action: a conceptual framework. *Cognition*, 107(1), 179−217.

Partington, A. 2004. Corpora and discourse, a most congruous beast. In Partington A., Morley, J. & Haarman, L. (eds.), *Corpora and Discourse*. Bern: Peter Lang, 11–20.

2008. The armchair and the machine: corpus-assisted discourse studies. In Taylor Torsello, C., Ackerley, K. & Castello, E. (eds.), *Corpora for University Language Teachers*. Bern: Peter Lang, 189–213.

Partington, A. & Morley, J. 2004. At the heart of ideology: word and cluster/bundle frequency in political debate. In Lewandowska-Tomaszczyk, B. (ed.), *Practical Applications in Language and Computers*. Frankfurt am Main: Peter Lang, 179–192.

Patten, T. 1993. Review of Matthiessen & Bateman (1991), *Text Generation and Systemic-Functional Linguistics: experiences from English and Japanese. Computational Linguistics*, 19(1), 201–203.

Peirce, C. S. 1955. The fixation of belief. In *The Philosophical Writings of Peirce, Selected and Edited with an Introduction by J. Buchler*. New York: Dover Publications, 5−22.

Pérez-Guerra, J. 1999. *Historical English Syntax: a statistical corpus-based study on the organisation of Early Modern English sentences*. München: Lincom Europa.

Perl, S. 1979. The composing processes of unskilled college writers. *Research in the Teaching of English*, 13(4), 817–836.

Perrett, G. 2000. Researching second and foreign language development. In Unsworth, L. (ed.), *Researching Language in Schools and Communities: functional linguistic perspective*. London: Cassell, 87–110.

Petersson, K., Foliam, V. & Hagoort, P. 2012. What artificial grammar learning reveals about the neurobiology of syntax. *Brain and Language*, 120(2), 83–95.

Poynton, C. & Lee, A. 2009. Debating appraisal: on networks and names. In Chen, H. & Cruickshank, K. (eds.), *Making a Difference: challenges in applied linguistics*. Newcastle-upon-Tyne: Cambridge Scholars Publishing, 21–36.

Praxedes Filho, P. 2007. A corpora-based study of the development of EFL Brazilian learners' interlanguage from simplification to complexification in the light of Systemic-Functional Grammar. Unpublished doctoral dissertation, Universidade Federal de Santa Catarina, Florianópolis, Santa Catarina, Brazil.

Price, C. 2009. The anatomy of language: a review of 100 fMRI studies published in 2009. *Annals of the New York Academy of Sciences: The Year in Cognitive Neuroscience*, 1191, 62–88.

Price, C. & Devlin, J. 2003. The myth of the visual word form area. *NeuroImage*, 19(3), 473–481.

Prince, E. 1992. The ZPG letter: subjects, definiteness, and information status. In Mann & Thompson (eds.), *Discourse Description: diverse linguistic analyses of a fund-raising text*. Amsterdam: Benjamins.

Pulvermüller, F. 2012. Meaning and the brain: the neurosemantics of referential, interactive, and combinatorial knowledge. *Journal of Neurolinguistics*, 25(5), 423–459.

Pulvermüller, F., Shtyrov, Y. & Hauk, O. 2009. Understanding in an instant: neurophysiological evidence for mechanistic language circuits in the brain. *Brain and Language*, 110, 81–94.

Quirk, R., Greenbum, S., Leech, G. & Svartvik, J. 1985. *A Comprehensive Grammar of the English Language*. London: Longman.

Raichle, M., MacLeod, A., Snyder, A., Powers, W., Gusnard, D. & Shulman, G. 2001. A default mode of brain function. *Proceedings of the National Academy of Sciences*, 98(2), 676–682.

Reiter, E. & Dale, R. 2000. *Building Natural Language Generation Systems*. Cambridge University Press.

Roochnik, D. 1996. *Of Art and Wisdom: Plato's understanding of techne*. Pennsylvania State University Press.

Rose, D. 1999. Cultural competence and schooling: approaches to literacy in indigenous school education. In Christie, F. (ed.), *Pedagogy and the Shaping of Consciousness: linguistic and social processes*. London: Cassell, 217−245.

2001. *The Western Desert Code: an Australian cryptogrammar*. Canberra: Pacific Linguistics.

Rosenblueth, R., Wiener, N. & Bigelow, J. 1943. Behaviour, purpose and teleology. *Philosophy of Science*, 19(1), 18−24.

Royall, D., Lauterback, E., Cummings, J., Reeve, A., Rummans, T., Kaufer, D., LaFrance, W. & Coffey, C. 2002. Executive control function: a review of its promise and challenges for clinical research. *Journal of Neuropsychiatry and Clinical Neurosciences*, 14, 377–405.

Rushworth, M., Behrens, T., Rudebeck, P. & Walton, M. 2007. Contrasting roles for cingulate and orbitofrontal cortex in decisions and social behaviour. *Trends in Cognitive Sciences*, 11(4), 168–178.

Sabb, F., Bilder, R., Chou, M. & Bookheimer, S. 2007. Working memory effects on semantic processing: priming differences in pars orbitalis. *NeuroImage*, 37, 311–322.

Safir, K. 1985. *Syntactic Chains*. Cambridge University Press.

Sager, N., Friedman, C. & Lyman, M. 1987. *Medical Language Processing: computer management of narrative data*. Reading: Addison-Wesley.

Sánchez-Macarro, A. & Carter, R. (eds.) 1998. *Linguistic Choice across Genres: variation in spoken and written English*. Amsterdam: Benjamins.

Sapir, E. 1921. *Language: an introduction to the study of speech*. New York: Harcourt Brace Jovanovich.

1949. *Selected Writings of Edward Sapir in Language, Culture, and Personality*. Mandelbaum, D. (ed.) Berkeley, CA: University of California Press.

Saussure, F. de 1959 [1916]. *Course in General Linguistics* (trans. W. Baskin). New York: Philosophical Library.

2006. *Writings in General Linguistics*. Bouquet, S. & Engler, R. (eds.). Translated by Sanders, C. & Piers, M. Oxford University Press.

Schwartz, M., Kimberg, D., Walker, G., Faseyitan, O., Brecher, A., Dell, G. & Coslett, H. 2009. Anterior temporal involvement in semantic word retrieval: voxel-based lesion symptom mapping evidence from aphasia. *Brain*, 132, 3411–3427.

Scollon, R. & Wong Scollon, S. 2007. Nexus analysis: refocusing ethnography on action. *Journal of Sociolinguistics*, 11(5), 608–625.

Scott, C. 2008a. Reporting Armistice: authorial and non-authorial voices in the *Sydney Morning Herald* 1902–2003. In Wu, C., Matthiessen, C. & Herke, M. (eds.) *Voices Around the World: Proceedings of the 35th International Systemic Functional Congress*. Sydney: Macquarie University, 131–136.

2008b. Reporting Armistice: grammatical evidence and semantic implications of diachronic context shifts. In Wu, C., Matthiessen, C. & Herke, M. (eds.) *Voices Around the World: Proceedings of the 35th International Systemic Functional Congress*. Sydney: Macquarie University, 125–130.

2009. Reporting Armistice: a diachronic, functional perspective. Unpublished PhD thesis, Macquarie University, Sydney.

2010. Peace and cohesive harmony: a diachronic investigation of structure and texture in 'end of war' news reports in *The Sydney Morning Herald*. In Yan, F. & Wu, C. (eds.) *Challenges to Systemic Functional Linguistics: theory and practice, Proceedings of the 36th International Systemic Functional Congress*. Beijing: The 36th ISFC Organising Committee, 89–96.

2011. Exploring diachronic register change in reports of Armistice 1902–2003. *Linguistics and the Human Sciences*, 4(3), 239–286.

Scott, M. 2008. WordSmith Tools version 5. Liverpool: Lexical Analysis Software.

Searle, J. 1969. *Speech Acts: an essay in the philosophy of language*. New York: Cambridge University Press.

Sebastiani, F. 2002. Machine learning in automated text categorization. *ACM Computing Surveys*, 34(1), 1–47

Segaert, K., Menenti, L., Weber, K., Petersson, K. & Hagoort, P. 2012. Shared syntax in language production and language comprehension – an fMRI study. *Cerebral Cortex*, 22, 1662–1670.

Selinker, L. 1992. *Rediscovering Interlanguage*. London: Longman.

Shannon, C. & Weaver, W. 1949. *The Mathematical Theory of Communication*. Urbana: University of Illinois Press.

Shapiro, J. 2011. *Evolution: a view from the 21st century*. New Jersey: FT Press Science.

Silverstein, M. 2003. Indexical order and the dialectics of sociolinguistic life. *Language and Communication*, 23, 193–229.

Simon-Vandenbergen, A. 2000. The functions of *I think* in political discourse. *International Journal of Applied Linguistics*, 10(1), 41–63.

Simon-Vandenbergen, A., White, P. & Aijmer, K. 2007. Presupposition and 'taking-for-granted' in mass communicated political argument – an illustration from British,

Flemish and Swedish political colloquy? In Fetzer, A. & Lauerbach, G. (eds.), *Political Discourse in the Media: cross-cultural perspectives,* Amsterdam: Benjamins, 31–74.
Sinclair, J. 1996. The search for units of meaning. *Textus*, 9/1, 75–106.
Sinclair, J. (editor-in-chief) 1995. *Collins COBUILD English Language Dictionary*. London: HarperCollins.
Slembrouck, S. 1992. The parliamentary Hansard 'verbatim' report: the written construction of spoken discourse. *Languages and Literature*, 1(2), 101–119.
Smith, K., Brighton, H. & Kirby, S. 2003. Complex systems in language evolution: the cultural emergence of compositional structure. *Advances in Complex Systems*, 6(4), 537–558.
Smyth, H. & Messing, G. 1974. *Greek Grammar*. Cambridge, MA: Harvard University Press.
Snijders, T. M., Petersson, K. M. & Hagoort, P. 2010. Effective connectivity of cortical and subcortical regions unification of sentence structure. *NeuroImage*, 52, 1633−1644.
Snijders, T., Vosse, T., Kempen, G., Van Berkum, J., Petersson, K. & Hagoort, P. 2009. Retrieval and unification of syntactic structure in sentence comprehension: an fMRI study using word-category ambiguity. *Cerebral Cortex*, 19, 1493–1503.
Sommers, N. 1980. Revision strategies of student writers and experienced adult writers. *College Composition and Communication*, 31(4), 378–388.
Soon, C., Brass, M., Heinze, H. & Haynes, J. 2008. Unconscious determinants of free decisions in the human brain. *Nature: Neuroscience*, 11, 543–545.
Souter, G. 1981. *Company of Heralds: a century and a half of Australian publishing by John Fairfax Limited and its predecessors 1831–1981*. Melbourne University Press.
Steele, T. 1990. *Missing Measures: modern poetry and the revolt against meter*. Fayetteville: University of Arkansas Press.
Steels, L. 2000. Language as a complex adaptive system. In Schoenauer, M., Deb, K., Rudolph, G., Yao, X., Lutton, E., Merelo, J. & Schwefel, H.-P. (eds.), *Parallel Problem Solving from Nature − PPSN-VI* (Lecture Notes in Computer Science). Berlin: Springer-Verlag, 17−26.
Steiner, E. & Yallop, C. (eds.) 2001. *Beyond Content: exploring translation and multilingual text production*. Berlin: de Gruyter.
Steiner, P. 1984. *Russian Formalism: a metapoetics*. Ithaca: Cornell University Press.
Stephens, M. 2007. *A History of News*, 3rd edn. Oxford University Press.
Sterelny, K. & Griffiths, P. 1999. *Sex and Death: an introduction to the philosophy of biology*. University of Chicago Press.
Stowe, L., Haverkort, M. & Zwarts, F. 2005. Rethinking the neurological basis of language. *Lingua*, 115, 997–1042.
Stubbs, M. 2001. *Words and Phrases: corpus studies of lexical semantics*. Oxford: Blackwell.
Sullivan, K. & Lindgren, E. (eds.) 2006. *Computer Keystroke Logging and Writing*. Amsterdam: Elsevier.
Svartvik, J. 1966. *On Voice in the English Verb* (Janua Linguarum, Series Practica, 63). The Hague: Mouton.

Swain, E. 2010. Reasoning around justification. Paper delivered at the 22nd European Systemic Functional Linguistics Conference and Workshop, Koper, Slovenia.

Sweetser, E. 1990. *From Etymology to Pragmatics: metaphorical and cultural aspects of semantic structure*. Cambridge University Press.

Swick, D., Ashley, V. & Turken, A. U. 2008. Left inferior frontal cortex is critical for response inhibition. *BMC Neuroscience*, 9, 102.

Tannen, D. 1989. *Talking Voices: repetition, dialogue and imagery in conversational discourse*. Cambridge University Press.

Tarone, E. 1983. On the variability of interlanguage systems. *Applied Linguistics*, 4, 142–164

Taverniers, M. 2011. The syntax−semantics interface in Systemic Functional Grammar: Halliday's interpretation of the Hjelmslevian model of stratification. *Journal of Pragmatics*, 43(4), 1100–1126.

Teich, E. 2003. *Cross-linguistic Variation in System and Text: a methodology for the investigation of translations and comparable texts*. Berlin: de Gruyter.

2009. Linguistic computing. In Halliday, M. A. K. & Webster, J. (eds.), *Continuum Companion to Systemic Functional Linguistics*. London: Equinox, 113−127.

Teich, E. & Degaetano-Ortlieb, S. 2011. The lexico-grammar of stance: an exploratory analysis of scientific texts. Paper presented at the workshop Beyond Semantics: Corpus-based Investigations of Pragmatic and Discourse Phenomena, Annual Meeting of Deutsche Gesellschaft für Sprachwissenschaft (DGfS) 2001, Göttingen, March 2011.

Teich, E. & Fankhauser, P. 2010. Exploring a corpus of scientific texts using data mining. In Gries, S., Wulff, S. & Davies, M. (eds.) *Corpus-linguistic Applications: current studies, new directions*. Amsterdam: Rodopi, 233–247.

Teich, E. & Holtz, M. 2009. Scientific registers in contact: a methodology and some findings. *International Journal of Corpus Linguistics*, 14(4), 524–548.

Thibault, P. 1987. An interview with Michael Halliday. In Steele, R. & Threadgold, T. (eds.) *Language Topics: essays in honour of Michael Halliday*, Vol. 2. Amsterdam: Benjamins, 601–627.

2004. *Agency and Consciousness in Discourse: self−other dynamics as a complex system*. London: Continuum.

Thiebaut de Schotten, M., Ffytche, D., Bizzi, A., Dell'Acqua, F., Allin, M., Walshe, M., Murray, R., Williams, S., Murphy, D. & Catani, M. 2011. Atlasing location, asymmetry and inter-subject variability of white matter tracts in the human brain with MR diffusion tractography. *NeuroImage*, 54, 49–59.

Thompson, G. 1999. Acting the part: lexico-grammatical choices and contextual factors. In Ghadessy, M. (ed.) *Text and Context in Functional Linguistics*. Amsterdam: Benjamins, 101–124.

2004. *Introducing Functional Grammar*, 2nd edn. London: Arnold.

forthcoming. *Conjunctive Relations in Discourse: a tri-functional study of six English registers*. London: Equinox.

Thompson, G. & Hunston, S. (eds.) 2006a. *System and Corpus: exploring connections*. London: Equinox.

2006b. System and corpus: two traditions with a common ground. In Thompson, G. & Hunston, S. (eds.) *System and Corpus: exploring connections*. London: Equinox, 1–14.

Thothathiri, M., Schwartz, M. & Thompson-Schill, S. 2010. Selection for position: the role of left ventrolateral prefrontal cortex in sequencing language. *Brain and Language*, 113, 28–38.

Thür, G. 2005. The role of the witness in Athenian law. In Gagarin, M. & Cohen, D. (eds.), *The Cambridge Companion to Ancient Greek Law*. Cambridge University Press, 146–169.

Todd, S. 1990. The purpose of evidence in Athenian courts. In Cartledge, P., Todd, S. & Millett, P. (eds.), *Nomos: essays in Athenian law, politics, and society*. Cambridge University Press, 19–39.

1993. *The Shape of Athenian Law*. Oxford: Clarendon.

Toolan, M. 2001. *Narrative: a critical linguistic introduction*. London: Routledge.

Trevarthen, C. & Hubley, P. 1978. Secondary intersubjectivity: confidence, confiding and acts of meaning in the first year. In Lock, A. (ed.), *Action, Gesture and Symbol*. London: Academic Press, 183–229.

Tucker, G. 1996. So grammarians haven't the faintest idea: reconciling lexis-oriented and grammar-oriented approaches to language. In Hasan, R., Cloran, C. & Butt, D. (eds.), *Functional Descriptions: theory in practice*. Amsterdam: Benjamins, 145–178.

1998. *The Lexicogrammar of Adjectives: a systemic functional approach to lexis*. London: Cassell Academic.

2006. Systemic incorporation: on the relationship between corpus and systemic functional grammar. In Thompson, G. & Hunston, S. (eds.), *System and Corpus: exploring connections*. London: Equinox, 81–102.

2007. Between lexis and grammar: towards a systemic functional approach to phraseology. In Matthiessen. C., Hasan, R. & Webster, J. (eds.) *Continuing Discourse on Language: a functional perspective*. London: Equinox, 953–977.

Tuckwell, K. 1999. The grammar of desire: complexity, metaphor and signification in Lacan. Unpublished honours thesis, Department of Linguistics, Macquarie University, Australia.

Ure, J. 1982. Introduction: approaches to the study of register and genre. *International Journal of the Sociology of Language*, 35(1), 5−23.

Vaihinger, H. 1924. *The Philosophy of 'as if': a system of the theoretical, practical, and religious fictions of mankind*, trans. C. K. Ogden. London: Routledge and Kegan Paul.

Van Dijk, T. 2008. *Discourse and Context: a sociocognitive approach*. Cambridge University Press.

Van Oosten, J. 1986. *The Nature of Subjects, Topics and Agents: a cognitive explanation*. Bloomington: Indiana University Linguistics Club.

Ventola, E. 1987. *The Structure of Social Interaction: a systemic approach to the semiotics of service encounters*. London: Frances Pinter.

1995. Generic and register qualities of texts and their realization. In Fries, P. & Gregory, M. (eds.), *Discourse in Society: systemic functional perspectives: meaning and choice in language: studies for Michael Halliday*. Norwood: Ablex, 3–28.

Vigneau, M., Beaucousin, V., Hervé, P.-Y., Duffau, H., Crivello, F., Houdé, O., Mazoyer, B. & Tzourio-Mazoyer, N. 2006. Meta-analyzing left-hemisphere language areas: phonology, semantics, and sentence processing. *NeuroImage*, 30, 1414–1432.

Villar, M. 2013, forthcoming. Modelización contextual y lingüística del folleto de promoción turística en línea y aplicaciones pedagógicas informatizadas. Tesis de maestría, Universidad Nacional de Cuyo, Mendoza, Argentina.

Vygotsky, L. 1978. *Mind in Society: the development of higher psychological processes*, Cole, M., John-Steiner, V., Scribner, S. & Souberman, E. (eds.). Cambridge, MA: Harvard University Press.

Waddington, C. 1977. *Tools for Thought*. Frogmore: Paladin.

Waldman, P. 2004. *Fraud: the strategy behind the Bush lies and why the media didn't tell you*. Naperville: Sourcebooks.

Walker, M., Joshi, A. & Prince, E. 1998. Centering in naturally occurring discourse: an overview. In Walker, M., Joshi, A. & Prince, E. (eds.), *Centering Theory in Discourse*. Oxford: Clarendon Press, 1–28.

Ward, G. & Birner, B. 1995. Definiteness and the English existential. *Language*, 71, 722–741.

Wardman, A. 1976. *Rome's Debt to Greece*. London: Bristol Classical Press.

Wardy, R. 1996. Mighty is the truth and it shall prevail? In Rorty, A. (ed.), *Essays on Aristotle's Rhetoric*. Berkeley: University of California Press, 56–87.

Weber, M. 1921 [1918]. Politik als Beruf. Speech at Munich University; published in Weber, M. (ed.), *Gesammelte Politische Schriften*, Drei Masken, Muenchen, 396–450; in Gerth, H. H. and Wright Mills, C. (trans. and eds.) 1946, *From Max Weber: essays in sociology*. New York: Oxford University Press, 77–128.

Weil, H. 1887. *The Order of Words in the Ancient Languages Compared with that of the Modern Languages*, trans. with an introduction by Super, C. Boston: Ginn.

White P. 2003. Beyond modality and hedging: a dialogic view of the language of intersubjective stance. *Text*, 23(2), 259–284.

Whitehead, A. N. 1920. *The Concept of Nature*. Cambridge University Press.

Whorf, B. L. 1956. *Language, Thought and Reality*, ed. J. B. Carroll. Cambridge, MA: MIT Press.

Wilson, J. 1990. *Politically Speaking: the pragmatic analysis of political language*. Oxford: Blackwell.

2003. Political discourse. In Schiffrin, D., Tannen, D. & Hamilton, H. (eds.), *The Handbook of Discourse Analysis*. Malden: Blackwell, 398–415.

Winograd, T. 1983. *Language as a Cognitive Process, Vol. 1: syntax*. Reading: Addison-Wesley.

Witten, I. & Eibe, F. 2005. *Data mining: practical machine learning tools and techniques*, 2nd edn. Amsterdam: Morgan Kaufmann.

Włodarczyk, A. & Włodarczyk, H. 2006. Subject in the Meta-Informative Centering Theory. *Études cognitives / Studia kognitywne*, VII, 7–32.

2008. The pragmatic validation of utterances. *Études cognitives / Studia kognitywne*, VIII, 117–128.

Xu, J., Kemeny, S., Park, G., Frattali, C. & Braun, A. 2005. Language in context: emergent features of word, sentence and narrative comprehension. *NeuroImage*, 25, 1002–1015.

Yang, X. 2010. *Modelling Text As Process: a dynamic approach to EFL classroom discourse*. London: Continuum.

Young, M. 1991. *The Vietnam Wars 1945–1990*. New York: Harper Perennial.

Yuan, J., Liberman, M. & Cieri, C. 2006. Towards an integrated understanding of speaking rate in conversation. *INTERSPEECH-2006,* 541−544.

Yunis, H. 1988. Law, politics and the 'graphê paranomon' in fourth-century Athens. *Greek, Roman and Byzantine Studies*, 29, 361–382.

(ed.) 2001. Demosthenes: *On the Crown*. Cambridge University Press.

Zock, M. 1996. The power of words in message planning. *COLING*, Copenhagen, 990–995.

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